Digitized by Arya Samaj Foundation Chennai and eGangotri

SUPPLEMENT TO GLOSSARY OF INDIAN MEDICINAL PLANTS

R.N. CHOPRA
I.C. CHOPRA
B.S. VERMA

8803
-S
R
633.8803
C45S:3

NATIONAL INSTITUTE OF SCIENCE COMMUNICATION, CSIR
Council of Scientific & Industrial Research, New Delhi -110012

REPRINTED 1998

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

R
633.8803
C455:2

121536

गुरुकुल कांगड़ी विश्वविद्यालय
कृपया पुस्तक के ऊपर कोई निशान आदि
न लगायें।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

R
633.8803
C455:2

पुस्तकालय
गुरुकुल कांगड़ी विश्वविद्यालय, हरिद्वार

121536

वर्ग संख्या..... .. आगत संख्या.....

पुस्तक-विवरण की तिथि नीचे अंकित हैं। इस तिथि सहित ३०वें दिन यह पुस्तक पुस्तकालय में वापिस आ जानी चाहिए। अन्यथा ५० पैसे प्रति दिन के हिसाब से विलम्ब-दण्ड लगेगा।

Central Library GK (DU) Haridwar

Central Library GK (DU) Haridwar

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

SUPPLEMENT TO GLOSSARY OF INDIAN MEDICINAL PLANTS

BY

R. N. CHOPRA

I. C. CHOPRA

B. S. VARMA

121536

NATIONAL INSTITUTE OF SCIENCE COMMUNICATION,CSIR,
NEW DELHI

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Editorial & Production Staff

S. A. Chari
K. N. N. Nayar
H. C. Jain
(Miss) S. P. Sareen
S. K. Das Gupta
P. N. M. Menon

ISBN:81-85038-87-2

R
633.8803
C459:2

Reprinted
1998

© 1969
National Institute of Science Communication (CSIR),
New Delhi

Printed by National Institute of Science Communication (CSIR),
Dr K S Krishnan Marg, New Delhi-110012

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PREFACE

The *Glossary of Indian Medicinal Plants* was published by the Council of Scientific & Industrial Research in June 1956 under the authorship of R. N. Chopra, S. L. Nayar and I. C. Chopra. The book has been much appreciated and well received by research workers dealing with indigenous drugs and medicinal plants, and it forms a constant source book of reference for botanists, chemists and pharmacologists.

Since the publication of the *Glossary*, a considerable amount of work on medicinal plants has been done and a large volume of literature has accumulated. In order to bring the *Glossary* up to date, it was thought worth while to publish a supplement containing all the information and references on the subject published between 1955 and 1964.

In this *Supplement*, the plants are arranged alphabetically according to their botanical names as in the *Glossary*. Plants which were not included in the *Glossary* and which occur for the first time in the *Supplement* have been marked with an asterisk. In such cases, their vernacular names, where available, synonyms, if any, distribution and habitat have been given as in the *Glossary*.

This *Supplement* like the original *Glossary*, we feel sure, will be helpful to those who are interested in Indian medicinal plants and indigenous drugs. Those who are interested in obtaining detailed information may refer to the original papers or abstracts, for which references are included.

We are indebted to Shri Y. K. Sarin for going through and checking the synonymy and other botanical information appearing in the *Supplement*.

Regional Research Laboratory
Jammu-Kashmir
Jammu, 23 March 1968

R. N. CHOPRA
I. C. CHOPRA
B. S. VARMA

Digitized by Arya Samaj Foundation Chennai and eGangotri

BOOKS REFERRED TO

B.P.C. 1959 — The British Pharmaceutical Codex (The Pharmaceutical Press, London), 1959.

BURKILL, I. H.— A Dictionary of the Economic Products of the Malay Peninsula (Crown Agents for the Colonies, London), 2 Vols., 1935.

CHOPRA, R. N., BADHWAR, R. L. & GHOSH, S.— Poisonous Plants of India (Manager of Publications, Delhi), 1949.

CHOPRA, R. N., CHOPRA, I. C., HANDA, K. L. & KAPUR, L. D.— Chopra's Indigenous Drugs of India (U. N. Dhur & Sons Private Ltd, Calcutta), 2nd edn, 1958.

GUENTHER, E.— The Essential Oils (D. Van Nostrand Co. Ltd, New York), 6 Vols., 1948-52.

HILDITCH, T. P.— The Chemical Constitution of Natural Fats (Chapman & Hall Ltd, London), 3rd edn, 1956.

KANJILAL, U. N. *et al.*— Flora of Assam (Government of Assam, Shillong), 5 Vols., 1934-40.

KIRK & OTHMER — Encyclopedia of Chemical Technology, edited by R. E. Kirk and D. F. Othmer (The Interscience Encyclopedia Inc., New York), 15 Vols., 1947-56.

KIRTIKAR, K. R. & BASU, B. D.— Indian Medicinal Plants (Lalit Mohan Basu, Allahabad), 4 Vols., 2nd edn, 1935.

LEWIS, F.— The Vegetable Products of Ceylon (The Associated Newspapers of Ceylon Ltd, Colombo), 1934.

NADKARNI, K. M.— Indian Materia Medica (Popular Book Depot, Bombay), 2 Vols., 3rd edn, 1954.

PERKIN, A. G. & EVEREST, A. E.— The Natural Organic Colouring Matters (Longmans Green & Co., London), 1918.

PHARMACOP. INDIA — Pharmacopoeia of India (Manager of Publications, Delhi), 1955.

STEINMETZ, E. F.— Materia Medica Vegetabilis (Holland), 3 Vols., 1954.

STEINMETZ, E. F.— Codex Vegetabilis (Amsterdam), 1957.

U.S.D. 1955 — The United States Dispensatory (J. B. Lippincott Co., Philadelphia), 25th edn, 1955.

WARING — Pharmacopoeia of India, 1868.

WATT, J. M. & BREYER-BRANDWIJK, M. G.— The Medicinal and Poisonous Plants of Southern Africa (E. & S. Livingstone, Edinburgh), 1932.

WLTH INDIA — Wealth of India — Raw Materials (Council of Scientific & Industrial Research, New Delhi), Vol. I-VI, 1948-62.

WEHMER, C.— Die Pflanzenstoffe (Gustav Fischer, Jena), 3 Vols., 1929-31; Supplement, 1935.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

JOURNALS REFERRED TO

Acad. Rep. Populare Romine Studii Cercetari Biochim.— Academia Republicii Populare Romine Institutul de Biochemie, Studii si Cercetari de Biochimie. Rumania.

Acta biochim. polon.— Acta biochimica polonica. Warszawa.

Acta chem. scand. — Acta chemica scandinavia. Kbenhavn.

Acta chim. hung.— Acta chimica Academiae scientiarum hungaricae. Budapest.

Acta med. philipp.— Acta medica philippina. Manila.

Acta pharm. hung.— Acta pharmaceutica hungarica. Budapest.

Acta pharm. int.— Acta pharmaceutica internationalis. Kbenhavn.

Acta pharm. jugosl.— Acta pharmaceutica jugoslavica. Zagreb.

Acta pharm. sin. — Acta pharmaceutica sinica. Peking.

Acta phytother.— Acta phytotherapeutica. Amsterdam.

Acta polon. pharm.— Acta Poloniae pharmaceutica. Warszawa.

Acta Primae Secundae Acad. med. Shanghai — Acta Primae et Secundae Academiae Medicinae Shanghai. Guozi Shudian.

Agra Univ. J. Res.— Agra University Journal of Research: Science. Agra.

Agric. biol. Chem. (Tokyo) — Agricultural and Biological Chemistry. Tokyo.

Agrochimica — Agrochimica. Pisa.

Agronomia, La Molina — Agronomia. La Molina. Peru.

Alex. J. agric. Res.— Alexandria Journal of Agricultural Research. Alexandria.

Am. Perfumer — American Perfumer. New York.

Am. Perfumer Arom.— American Perfumer and Aromatics. New York.

Amer. J. Pharm.— American Journal of Pharmacy. Philadelphia.

Amer. Scient.— American Scientist. New Haven.

An. Acad. Farm., Madr.— Anales R. Academia de farmacia. Madrid.

An. Dir. nac. Quim., B. Aires — Anales Direccion nacional de quimica. Buenos Aires.

An. Fac. Farm. Bioquim. Univ. S. Marcos — Anales de la Facultad de farmacia y bioquimica Universidad nacional de San Marcos. Lima.

An. R. Soc. Espan. Fis. Quim.— Anales de la R. Sociedad espanola de fisica y quimica. Madrid.

An. Soc. Biol. Bogota — Anales de la Sociedad de biologia de Bogota.

Anais Acad. bras. Cienc.— Anais da Academia brasileira de Sciencias. Rio de Janeiro.

Anais Ass. bras. Quim.— Anais da Associacao brasileira de quimica. Sao Paulo.

Anais Fac. Farm. Odontol. Univ. Sao Paulo — Anais da Faculdade de Farmacia e Odontologia da Universidade de Sao Paulo. Brazil.

Anais Fac. Farm. Porto — Anais da Faculdade de farmacia do Porto.

Analyst — Analyst. London.

Analyt. Abstr.— Analytical Abstracts. Cambridge.

Analyt. Chem.— Analytical Chemistry. Easton. Pa.

Ann. Biochem.— Annals of Biochemistry and Experimental Medicine. Calcutta.

Ann. chim. Roma — Annali di chimica applicata. Roma.

Ann. Fac. Med. Univ. Recife — Annaes da Faculdade de medicina da Universidade do Recife. Recife.

Ann. pharm. franc.— Annales pharmaceutiques francaises. Paris.

Ann. Univ. M. Curie-Sklodowska — Annales Universitatis Mariae Curie-Sklodowska. Lublin.

Annls Acad. med. cracov.— Annales Academiae medicae cracoviensis.

Annual Reports — *See* Reports.

Antibiotics Chemother. — Antibiotics and Chemotherapy. New York.

Antiseptic — Antiseptic. Edinburgh and Madras.

Aptech. Delo — Aptechnoe delo. Moskva.

Arch. Biochem. Biophys.— Archives of Biochemistry and Biophysics. New York.

Arch. Bioquim. Quim. Farm.— Archivos de Bioquimica, Quimica y Farmacia. Tucuman.

Arch. Farm. Bioquim. Tucuman — Archivos de farmacia y bioquimica de Tucuman.

Arch. Inst. biol.— Archivos do Instituto biologico. Sao Paulo, Brazil.

Arch. int. Pharmacodyn. — Archives internationales de pharmacodynamie (et de therapie). Bruxelles — Paris.

CC-0. In Public Domain. Panini Kanya Maha Vidyalaya Collection.

Digitized by Arya Samaj Foundation Chennai and eGangotri

Arch. Pharm. Berl. — Archiv der Pharmazie (und Berichte der Deutschen pharmazeutischen Gesellschaft). Berlin.
Arch. Zootecnia — Archivos de zootecnia. Cordoba.
Arzneimittel-Forsch .— Arzneimittel-Forschung. Aulendorf.
Ather. Ole.— Atherische Ole, Riechstoffe, Parfumerien, Essenzen und Aromen. Hannover.
Aust. J. biol. Sci.— Australian Journal of Biological Sciences. Melbourne.
Aust. J. Chem.— Australian Journal of Chemistry. Melbourne.
Aust. J. exp. Biol. med. Sci.— Australian Journal of Experimental Biology and Medical Science. Adelaide.
Aust. J. Pharm.— Australian Journal of Pharmacy. Melbourne.
Aust. J. sci. Res.— Australian Journal of Scientific Research. Melbourne.

Ber. dtsch. bot. Ges.— Bericht der Deutschen Botanischen Gesellschaft. Berlin.
Ber. dtsch. chem. Ges.— Bericht der Deutschen Chemischen Gesellschaft. Berlin.
Ber. Schweiz. bot. Ges.— Bericht der Schweizerischen Botanischen Gesellschaft. Bern.
Biochem. J.— Biochemical Journal. Cambridge.
Biochim. biophys. Acta — Biochimica et biophysica acta. New York and Amsterdam.
Biokhimiya — Biokhimiya. Moskva.
Biol. Abstr.—Biological Abstract, Menasha, Philadelphia.
Biul. Inst. Rosl. leczn.— Biuletyn Instytutu roslin leczniczych. Poznan.
Blyttia — Blyttia. Norsk Botanisk Forenings Tidsskrift. Oslo.
Bol. Esc. Farm. Univ. Coimbra — Boletim da Escola de farmacia, Universidade de Coimbra. Coimbra, Port.
Bol. Inst. nac. Tech., Rio de J.— Boletim de informacoes. Instituto nacional de technologia. Rio de Janeiro.
Boll. chim.-farm.— Bollettino chimico-farmaceutico. Milano.
Boll. Soc. eustach inst. sci. Univ. Camerino — Bollettino della Societa Eustachiana degli Instituti Scientifici dell' Universita di Camerino.
Boll. Soc. ital. Biol. sper.— Bolletino della Societa italiana di biologia sperimentale. Napoli.
Bot. Bull. Acad. sinica— Botanical Bulletin of Academia Sinica. Shanghai.
Bot. Gaz.— Botanical Gazette. Chicago.
Bot. Mus. Leafl. Harv. Univ.— Botanical Museum Leaflets. Harvard University. Cambridge, Mass.
Brit. J. Pharmacol.— British Journal of Pharmacology and Chemotherapy. London.
Brit. med. J.— British Medical Journal. London.

Bull. Acad. pol. Sci. Cl. II Ser. Sci. biol.— Bulletin de l'Academie polonaise des sciences. classe II. Serie des sciences biologiques. Varsovie.
Bull. agric. chem. Soc. Japan — Bulletin of the Agricultural Chemical Society of Japan. Tokyo.
Bull. agric. Congo belge — Bulletin agricole du Congo belge. Bruxelles.
Bull. Calcutta Sch. trop. Med. Hyg.— Bulletin of the Calcutta School of Tropical Medicine and Hygiene. Calcutta.
Bull. cent. Fd technol. Res. Inst., Mysore — Bulletin. Central Food Technological Research Institute. Mysore.
Bull. cent. Leath. Res. Inst., Madras — Bulletin. Central Leather Research Institute. Madras.
Bull. cent. Res. Inst. Univ. Kerala — Bulletin of the Central Research Institute, University of Kerala. Trivandrum.
Bull. cent. Res. Inst. Univ. Travancore — Bulletin of the Central Research Institute, University of Travancore. Trivandrum.
Bull. Coun. sci. industr. Res. Aust.— Bulletin. Council of Scientific and Industrial Research. Melbourne.
Bull. Dep. Agric. Ind. neerl.— Bulletin du dep, de l'agriculture aux Index Neerlandaises. Buitenzorg.
Bull. Dep. sci. industr. Res., N.Z.— Bulletin. Department of Scientific and Industrial Research. New Zealand.
Bull. econ. Indoch.— Bulletin economique de l'Indochine. Hanoi — Haiphong.
Bull. Galenica — Bulletin Galenica. Bern.
Bull. imp. Inst., Lond. — Bulletin of the Imperial Institute. London.
Bull. Indian Coun. agric. Res.— Bulletin. Indian Council of Agricultural Research. New Delhi.
Bull. Inst. Chim. Acad. Bulgare Sci.— Bulletin de l'Institut Chimiqué, Academie Bulgare de Sciences. Sofia, Bulgaria.
Bull. Jap. Soc. sci. Fish. — Bulletin of the Japanese Society of Scientific Fisheries. Tokyo.
Bull. Minist. Agric., Lond.— Bulletin. Ministry of Agriculture and Fisheries, London.
Bull. Narcot.— Bulletin on Narcotics. Geneva, New York.
Bull. natl. hyg. Lab. Tokyo — Bulletin of the National Hygienic Laboratory. Tokyo.
Bull. Org. sci. Res. Indonesia — Bulletin. Organization for Scientific Research in Indonesia.
Bull. reg. Res. Lab. Jammu — Bulletin of the Regional Research Laboratory, Jammu.
Bull. sci. industr. Res. Org., Melbourne — Bulletin. Commonwealth Scientific and Industrial Research Organization, Melbourne.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Bull. Soc. chim. Fr.— Bulletin. Societe chimique de France. Paris.
Bull. Soc. Pharm. Bordeaux — Bulletin des travaux de la societe de pharmacie de Bordeaux.

C.R. Acad. bulg. Sci.— Compte rend de l'Academie bulgare des sciences. Sofia.
C.R. Acad. Sci., Paris — Comptes rendu hebdomadaire des seances de l'Academie des sciences. Paris.
Canad. J. Chem.— Canadian Journal of Chemistry. Ottawa.
Canad. J. Res.— Canadian Journal of Research. Ottawa.
Canad. pharm. J.— Canadian Pharmaceutical Journal. Toronto.
Chem. Abstr.— Chemical Abstracts. Easton, Pa.
Chem. Ber.— Chemische Berichte. Heidelberg und Berlin.
Chem. Engng News — Chemical and Engineering News. Easton, Pa.
Chem. & Ind.— Chemistry and Industry (Review). London.
Chem. Listy — Chemicke Listy. Praha.
Chem. pharm. Bull. Tokyo — Chemical and Pharmaceutical Bulletin. Tokyo.
Chem. Tr. J.— Chemical Trade Journal and Chemical Engineer. Manchester.
Chem. Zbl.— Chemisches Zentralblatt. Berlin.
Chem. Zvesti — Chemicke Zvesti. Bratislava.
Chron. nat.— Chronica naturae. Kolff, Batavia.
Cienc. Med. Rio de J.— Ciencia medica. Rio de Janeiro.
Ciencia, Mex.— Ciencia. Revista hispano-americana de ciencias puras y aplicadas. Mexico.
Colln Czech. chem. Commun. Engl. Edn — Collection of Czechoslovak Chemical Communications, English Edition. Praha.
Congr. Luso-espan. farm.— Congresso Luso-Espanhol de Farmacia, 2° Congresso. Oporto, Purtgal.
Contr. Boyce Thompson Inst.— Contributions. Boyce Thompson Institute for Plant Research. Menasha Wis.
Cslka Farm.— Ceskoslovenska farmacie. Praha.
Curr. med. Pract.— Current Medical Practice. Bombay.
Curr. Sci.—Current Science. Bangalore.

Diss. Abstr.— Dissertation Abstracts. Ann Arbor.
Dissnes pharm., Warsz.— Dissertationes pharmaceuticae. Warszawa.
Dokl. Akad. Nauk Azerb. SSR — Doklady Akademii nauk Azerbaidzhanskoi SSR. Baku.
Dokl. Akad. Nauk SSSR — Doklady Akademii nauk SSSR. Moskva, Leningrad.
Dokl. Akad. Nauk uzbek. SSR — Doklady Akademii nauk Uzbekskoi SSR. Tashkent.

Dopov. Akad. Nauk URSR — Dopovidi Akademiyi nauk Ukrainskoi RSR. Kiev.
Drug Stand.— Drug Standards. Washington.
Dtsch. Apoth-Ztg.— Deutsche Apothekerzeitung. Berlin.
Dtsch. F. ges. gerichtl. Med.— Deutsche Zeitschrift fur die gesamte gerichtliche Medizin. Berlin.

Econ. Bot.— Economic Botany. Lancaster, Pa.
Egypt. J. Chem.— Egyptian Journal of Chemistry. Cairo.
Egypt. Pharm. Bull.— Egyptian Pharmaceutical Bulletin of the Pharmaceutical Society of Egypt & the Syndicate of Pharmacists. Cairo.
Essenze.— Essenze, derivati agrumari. Reggio Calabria.
Euphytica — Euphytica. Wageningen.
Experienceas, Madrid — Experienceas. Madrid.
Experientia — Experientia. Basel.

Farm. Glasn.— Farmaceutiski Glasnik. Zagreb.
Farm. Notisbl.— Farmaceutiskt notisblad. Helsingfors.
Farm. Polska — Farmacja polska. Warszawa.
Farm. Zh.— Farmatsevtichnii Zhurnal. Kiev.
Farmacia, Buc.— Farmacia. Bucuresti.
Farmaco Ed. pract.— Farmaco. Pavia. Edizione pratica.
Farmacognosia — Farmacognosia. Madrid.
Farmak. Toks.— Farmakologiya i toksikologiya. Moskva.
Farmatsiya Sof.— Farmatsiya. Sofiya.
Fed. Proc.— Federation Proceedings. (American Societies for Experimental Biology). Baltimore.
Fette Seifen. Anstr-Mittel — Fette, Seifen, Anstrichmittel verbunden mit die Ernahrungsindustrie. Hamburg.
Fitoterapia — Fitoterapia. Rivista trimestrale di studi e applicazioni di piante medicinali. Milano.
Folia Pharm. jap.— Folia pharmacologica japonica. Kyoto.
Food Res.— Food Research. Champaign, Ill.
Food Sci.— Food Science. Mysore.
Food Sci. Abstr.— Food Science Abstracts. London.
For. Res. India — Forest Research in India. Delhi.
Formosan Sci.— Formosan Science. Formosan Association for Advancement of Science. Taipei.
Fr. Parf.— France et ses parfums. Lyon.

Galenica Acta — Galenica Acta. Madrid.
Garcia Orto — Garcia de Orto. Revista da Junta das missoes geographicas e de investigacoes do ultramar. Lisboa.
Gazz. chim. ital.— Gazzetta chimica italiana. Roma.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Helv. chim. acta — Helvetica chimica acta. Basel, Genf.
Hlth Bull.— Health Bulletin. Delhi.
Hoppe-Seyl. Z.— Hoppe-Seyler's Zeitschrift fur physiologische chemie. Strassburg.
Hort. Abstr.— Horticultural Abstracts. East Malling.

Igaku Kenkyu — Igaku Kenkyu (Acta Medica). Fukuoka.
Igaku to Seibutsugaku — Igaku to Seibutsugaku (Medicine and Biology). Tokyo, Japan.
Indian Bee J.— Indian Bee Journal. Jeolikote, Nainital.
Indian Fmg — Indian Farming. Delhi.
Indian For.— Indian Forester. Dehra Dun.
Indian For. Leafl—Indian Forest Leaflets. Dehra Dun.
Indian Heart J.— Indian Heart Journal. Calcutta.
Indian J. agric. Sci.— Indian Journal of Agricultural Science. New Delhi.
Indian J. appl. Chem.— Indian Journal of Applied Chemistry. Calcutta.
Indian J. Chem.— Indian Journal of Chemistry. New Delhi.
Indian J. Ent.— Indian Journal of Entomology. New Delhi.
Indian J. exp. Biol.— Indian Journal of Experimental Biology. New Delhi.
Indian J. Hort.— Indian Journal of Horticulture. Sabour.
Indian J. med. Res.— Indian Journal of Medical Research. Calcutta.
Indian J. Pharm.— Indian Journal of Pharmacy. Banaras.
Indian J. Physiol. all. Sci.— Indian Journal of Physiology and Allied Sciences. Calcutta.
Indian J. Physiol. Pharmac.— Indian Journal of Physiology and Pharmacology. Lucknow.
Indian J. Technol.— Indian Journal of Technology. New Delhi.
Indian J. vet. Sci.— Indian Journal of Veterinary Science and Animal Husbandry. New Delhi.
Indian med. Gaz.—Indian Medical Gazette. Calcutta.
Indian Oil Soap J.— Indian Oil and Soap Journal. Calcutta.
Indian Perfumer — Indian Perfumer. Kanpur.
Indian Pharm.— Indian Pharmacist. Calcutta.
Indian Soap J.— Indian Soap Journal. Calcutta.
Indian Tr. J.— Indian Trade Journal. New Delhi.
Industr. Engng Chem.— Industrial and Engineering Chemistry. Easton, Pa.
ISI Bull.— Indian Standards Institution Bulletin. New Delhi.
Izv. Akad. Nauk azerb. SSR — Izvestiya Akademii nauk Azerbaidzhanskoi SSR. Baku.
Izv. Akad. Nauk Kazakh. SSR — Izvestiya Akademii nauk Kazakhskoi SSR. Alma-Ata. Seriya Khimicheskaya.

Jap. J. Genet.— Japanese Journal of Genetics. Tokyo.
Jap. J. Pharm. Chem.— Japanese Journal of Pharmacy and Chemistry. Osaka.
J. agric. Fd Chem.— Journal of Agricultural and Food Chemistry. Easton, Washington.
J. Agric. Univ. P.R.— Journal of Agriculture of the University of Puerto Rico.
J. agric. West. Aust.— Journal of Agriculture of Western Australia. Perth.
J. Amer. chem. Soc.— Journal of American Chemical Society. Easton, Pa.
J. Amer. Oil Chem. Soc.— Journal of the American Oil Chemists Society. Chicago.
J. Amer. pharm. Ass.— Journal of the American Pharmaceutical Association. Columbus.
J. Amer. pharm. Ass., Sci. Ed.— Journal of American Pharmaceutical Association. Science Edition. Columbus.
J. biol. Chem.— Journal of Biological Chemistry. Baltimore.
J. biol. Sci.— Journal of Biological Sciences. Bombay.
J. Bombay nat. Hist. Soc.— Journal of the Bombay Natural History Society. Bombay.
J. chem. Soc.— Journal of the Chemical Society. London.
J. chem. Soc. Japan — Journal of the Chemical Society of Japan. Tokyo.
J. Chem. U.A.R.— Journal of Chemistry of the United Arab Republic. Cairo.
J. Chromat.— Journal of Chromatography. Amsterdam, London.
J. econ. Ent.— Journal of Economic Entomology. Geneva, N.Y.
J. Egypt. med. Ass.— Journal of the Egyptian Medical Association. Cairo.
J. Fd Sci.— Journal of Food Science. Champaign. Ill.
J. Formosan med. Ass.— Journal of the Formosan Medical Association. Taipei.
J. Hyg. Epidem. Microbiol. Immun.— Journal of Hygiene, Epidemiology. Microbiology and Immunology. Prague.
J. Indian bot. Soc.— Journal of the Indian Botanical Society. Madras.
J. Indian chem. Soc.— Journal of the Indian Chemical Society. Calcutta.
J. Indian chem. Soc. industr. Edn — Journal of the Indian Chemical Society. Industrial and News Edition. Calcutta.
J. Indian Inst. Sci.— Journal of the Indian Institute of Science. Bangalore.
J. Indian med. Ass.— Journal of Indian Medical Association. Calcutta.
J. Instn Chem. India — Journal and Proceedings of the Institution of Chemists (India). Calcutta.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

J. Maharaja Sayajirao Univ. Baroda — Journal of the Maharaja Sayajirao University of Baroda. Baroda.
J. medni pharm. Chem.— Journal of Medicinal and Pharmaceutical Chemistry. New York, London.
J. Mysore Univ.— Journal of the Mysore University. Mysore.
J. org. Chem.— Journal of Organic Chemistry. Baltimore.
J. Osaka Cy med. Cent.— Journal of the Osaka City Medical Centre. Osaka.
J. pharm. Ass. Thailand — Journal of the Pharmaceutical Association of Thailand. Bangkok.
J. Pharm., Lond.— Journal of Pharmacy and Pharmacology. London.
J. pharm. Sci.— Journal of Pharmaceutical Sciences. Baltimore.
J. pharm. Sci. U.A.R.— Journal of Pharmaceutical Sciences of the United Arab Republic. Cairo.
J. pharm. Soc. Japan — Journal of the Pharmaceutical Society of Japan. Tokyo.
J. Pharmacol.— Journal of Pharmacology and Experimental Therapeutics. Baltimore.
J. postgrad. Med.— Journal of Postgraduate Medicine. Bombay.
J. Proc. Aust. chem. Inst.— Journal and Proceedings of Australian Chemical Institute. Melbourne.
J. Proc. Oil Tech. Ass. India — Journal and Proceedings of the Oil Technologists' Association, India. Kanpur.
J. Proc. R. Soc. N.S.W.— Journal and Proceedings of the Royal Society of New South Wales. Sydney.
J. Sci. Fd Agric.— Journal of the Science of Food and Agriculture. London.
J. sci. industr. Res.— Journal of Scientific & Industrial Research. New Delhi.
J. sci. Res. Banaras Hindu Univ.— Journal of Scientific Research of the Banaras Hindu University. Banaras.
J. Soc. chem. Ind., Lond.— Journal of the Society of Chemical Industry. London.
J. vet. Res.— Journal of Veterinary and Animal Husbandry Research. Mhow.
J. Taiwan pharm. Ass.— Journal of the Taiwan Pharmaceutical Association. Taiwan, China.
J. Univ. Bombay — Journal of the University of Bombay. Fort, Bombay.

Kanazawa Daigaku Yakugakubu Kenkyu Nempo — Kanazawa Daigaku Yakugakubu Kenkyu Nempo. Kanazawa, Japan.
K'O Hsueh T'ung Pao — K'O Hsueh T'ung Pao (Scientia) Guozi Shudian.
Koninkl. Ned. Akad. Wetenschap Proc.— Koninklijke Nederlandse Akademie van Wetenschappen, Proceedings. North Holland.
Koryo — Koryo (Aromatics). Tokyo.

Labo-Pharm.— Labo-Pharma. Revue d'Etude et de Documentation Pharmaceutiques. Paris.
Lloydia — Lloydia: a quarterly journal of biological science. Manasha, Wis.
Lloydia Cincinnati — Lloydia Cincinnati. Ohio.
Lucr. Inst. Cerc. aliment — Lucrarile Institutului de cercetari alimentare. Bucuresti.
Lucr. Prezentate Conf. nat. farm. Bucharest — Lucrarile Prezentate la Conferinta Nationala de Farmacie (Proceedings of the National Conference of Pharmacy). Bucharest, Rumania.

Magyar Kem. Lapja — Magyar Kemikusok lapja. Budapest.
Med. Dig. Bombay — Medical Digest. Bombay.
Med. Mschr.— Medizinische Monatsschrift. Stuttgart.
Med. parasit. Moscow — Meditsinskaya parazitologia i parazitarnye bolezni. Moskva.
Med. Prom. SSSR — Meditsinskaya promyshlennost SSSR. Moskva.
Med. trop.— Medicina tropical. Madrid.
Medd. Norsk Farm. Selskap.— Meddelelser fra Norsk Farmaceutisk Selskap. Oslo, Norway.
Mem. Dep. Agri. Madras — Memoirs of Department of Agriculture. Madras.
Memor. Serv. chim. Etat.— Memorial des Services chimiques de l'etat. Paris.
Mfg. Chem.— Manufacturing Chemist. London.
Mus. Technol. appl. Sci.— Museum of Technology and Applied Science. Sydney, Australia.

Nagoya Shiritsu Daigaku Yakugakubu Kiyo — Nagoya Shiritsu Daigaku Kyovobu Kiyo (Bulletin of the Nagoya city University, Pharmaceutical School). Nagoya, Japan.
Nature, Lond.— Nature. London.
Naturwissenschaften — Naturwissenschaften. Berlin.
Nauch. Soobschch. Inst. Fiziol. Akad. Nauk SSSR — Nauchnoe soobschchenie. Institut Fiziology, Akademiya Nauk SSSR.
N.Z. J. Sci. Tech.— New Zealand Journal of Science and Technology. Wellington.
N.Z. Jl. Sci.— New Zealand Journal of Science. Wellington.
Nippon kagaku zasshi — Nippon Kagaku Zasshi. Tokyo.
Not. farm., Porto — Noticias farmaceuticas. Porto.
Nutr. Abstr. Rev.— Nutrition Abstracts and Reviews. Aberdeen.

Orv. Szle—Orvos Szemle. Marosvasarhely.

Pakist. J. biol. agric. Sci.— Pakistan Journal of Biological and Agricultural Sciences. Dacca.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Pakist. J. For.— Pakistan Journal of Forestry. Abbottabad.

Pakist. J. sci. ind. Res.— Pakistan Journal of Scientific and Industrial Research. Karachi.

Parfum. cosmet. Savons — Parfumerie, cosmetiques, Savons. Paris.

Parfum. Kosmetik — Parfumerie und Kosmetik. Berlin.

Pchelovodstov — Pchelovodstov. Vyatka.

Perfum. essent. Oil Rec.— Perfumery and Essential Oil Record. London.

Pharm. Acta Helvet.— Pharmaceutica acta helvetiae. Zurich.

Pharm. Bull.— Biuletyn Farmaceutyozyny Organ Farmacji polskij poca granicani, Kraju. London.

Pharm. Bull. Tokyo — Pharmaceutical Bulletin. Tokyo.

Pharm. Weekbl.— Pharmaceutisch Weekblad voor Nederland. Amsterdam.

Pharm. Zentralh.— Pharmazeutische Zentralhalle fur Deutschland. Dresden.

Pharm. Ztg.— Pharmazeutische Zeitung. Berlin.

Pharm. Ztg. Ver. Apotheker-Ztg.— Pharmazeutische Zeitung, Vereinigt mit Apotheker-Zeitung. Frankfurt.

Pharmazie — Pharmazie. Berlin.

Philipp. J. Sci.— Philippine Journal of Science. Manila.

Planta Med.— Planta Medica. Stuttgart.

Plant Physiol.— Plant Physiology. Lancaster, Pa.

Poona agric. Coll. Mag.— Poona Agricultural College Magazine. Poona.

Proc. a. Conv. Oil Technol. Ass. India — Proceedings of Annual Convention of Oil Technologists Association. India.

Proc. chem. Soc., Lond.— Proceedings of the Chemical Society. London.

Proc. Indian Acad. Sci.— Proceedings of the Indian Academy of Sciences. Bangalore.

Proc. Indian Sci. Congr.— Proceedings of the Indian Science Congress. Calcutta.

Proc. int. Pharmacol.— Proceedings. International Pharmacology.

Proc. nat. Acad. Sci. India — Proceedings of National Academy of Sciences of India. Allahabad.

Proc. nat. Inst. Sci. India. Ser. B Biol. Sci.— Proceedings of National Institute of Sciences of India. Ser. B. Biological Sciences. Calcutta & New Delhi.

Proc. Okla. Acad. Sci.— Proceedings of the Oklahoma Academy of Science. Stillwater.

Proc. Pacif. Sci. Congr. Bangkok — Proceedings of Pacific Science Congress. Bangkok.

Proc. Pacif. Sci. Congr. Quezon City — Proceedings of Pacific Science Congress of the Pacific Science Association, 8th Congress, University of Philippines, Diliman, Quezon City, 1953.

Proc. Pakist. Sci. Conf.— Proceedings of Pakistan Science Conference. Lahore.

Proc. pharm. Soc. Egypt. Sci. Ed.— Proceedings of the Pharmaceutical Society of Egypt. Science Edition. Cairo.

Proc. Soc. exp. Biol., N.Y.— Proceedings. Society for Experimental Biology and Medicine. New York.

Przem. chem.— Przemysl Chemiczny. Warszawa.

Przem. spozyw.— Przemysl spozywczy. Warszawa.

Punjab Fr. J.— Punjab Fruit Journal. Lahore.

Q. Jl. crude Drug Res.— Quarterly Journal of Crude Drug Research. Amsterdam.

Qualitas Pl. Mater. veg.— Qualitas plantarum et materiae vegetabiles. Den Haag.

Radio-chim. Acta — Radiochimica acta. Frankfurtam-Maiu.

Rec. bot. Surv. India — Records of the Botanical Survey of India. Calcutta.

Rec. Trav. chim. Pays-Bas — Recueil des travaux chimiques des Pays-Bas et de la Belgique. Leyde.

Referat. Zh. Khim. Biol. Khim.— Referativnyi Zhurnal Khimiya: Biologicheskaya Khimiya. Moskva.

R.C. Ist., sup. Sanit. — Rendiconti del l'Instituto superiore di sanita. Roma.

R.C. Semin. Sci. Cagliari — Rendiconti del Seminario della Facolta di scienze della R. Universita di Cagliari.

Rep. Aust. Ass. Adv. Sci.—Report. Australian and New Zealand Association for the Advancement of Science. Sydney.

Rep. ess. Oils, Schimmel — Report on Essential Oils, Synthetic Perfumes, Schimmel & Co. Melitz. Leipzig.

Rep. Fac. Pharm. Kanazawa Univ.— Report of the Faculty of Pharmacy, Kanazawa University, Kanazawa.

Rep. Indian vet. Res. Inst. Muktesar Izatnagar — Report. Indian Veterinary Research Institute. Muktesar & Izatnagar.

Rep. ITSUU Lab.— Report of the ITSUU Laboratory. Tokyo.

Rep. Marketing Tapioca India — Report on the Marketing of Tapioca in India, Ministry of Food and Agriculture, Government of India, New Delhi.

Rep. Shionogi Res. Lab.— Report. Shionogi Research Laboratory. Osaka.

Rep. Takamine Lab.— Report. Takamine Laboratory, Sankyo Co. Tokyo.

Rep. Tokyo Coll. Pharm.— Report of the Tokyo College of Pharmacy. Tokyo.

Res. J. Hindi Sci. Acad.— Research Journal of the Hindi Science Academy. Allahabad.

Rev. bras. Farm.— Revista brasileira de farmacia. Rio de Janeiro.

Rev. Farm. Bucuresti — Revista farmacici. Bucuresti.

Rev. Flora med.— Revista da flora medicinal. Rio de Janeiro.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Rev. Quim. industr. Rio de J.— Revista de quimica industrial. Rio de Janeiro.
Riechstoffe Aromen — Riechstoffe und Aromen. Hannover.
Riechstoffe Aromen Koerperpflegemittel — Riechstoffe Aromen, Koerperpflegemittel. Hannover.
Riv. ital. Essenze — Rivista italiana delle essenze. Milano.
Riv. ital. Essenze Profumi — Rivista italiana essenze, profumi, piante officinali olii vegetale saponi. Milano.
Roczn. Chem.— Rocznik chemji. Warszawa.
Roczn. Nauk roln. Ser. A — Rocznik nauk rolniczych. Seria A. Krakow, Poznan, Warszawa.

Saugar Univ. J.— Saugar University Journal. Saugar.
Sb. Trud. azerb. med. Inst.— Sbornik Trudov Azerbaidzhanskogo Gosudarstvennogo Meditsinskogo Instituta. Azerbaidzhan, SSR.
Science — Science. New York.
Sci. Agric.—Scientific Agriculture. Ottawa.
Sci. & Cult.— Science and Culture, Calcutta.
Sci. pharm.— Scientia pharmaceutica. Wien.
Sci. Rec., Chungking — Science Record. Academia Sinica. Chungking, Peking.
Scr. med. Brno — Scripta medica facultatum medicinae Universitatis masarykianae. Brno.
Shikoku Acta med.— Shikoku acta medica. Tokushima.
Soap Perfum. Cosmet. — Soap, Perfumery and Cosmetics. London.
Soap Perfum. Cosmet. Tr. Rev.— Soap, Perfumery and Cosmetics (Trade Review). London.
Soc. biol. Chem. India, Silver Jubilee Souvenir, 1955 — Society of Biological Chemists, India. Silver Jubilee Souvenir, 1955. Bangalore, India.
Soviet Res. pharm. Chem.— Soviet Research in Pharmaceutical Chemistry 1956, Pt. III. *Pharmacognosy*. Consultant Bureau Inc. New York.
Spirt. Prom.— Spirtovaya promyshlennost. Moskva.
Svensk farm. Tidskr.— Svensk Farmaceutisk Tidskrift. Stockholm.

Tech. Bull. cent. Fd Technol. Res. Inst.— Technical Bulletin. Central Food Technological Research Institute. Mysore.
Tech. Bull. Med. Plants Philipp. Dep. agric. nat. Resources — Technical Bulletin. Medicinal Plants of Philippines. Department of Agriculture and Natural Resources. Manila.
Tetrahedron — Tetrahedron. London, New York.
Tetrahedron Lett.— Tetrahedron Letters. London.
Therapie — Therapie. Paris.
Tohuku J. exp. Med. Tohuku Journal of Experimental Medicine. Sendai.
Tr. Nauchnoizsled. Inst. Farm.— Trudove na Nauchnoiz-sledovatelski Institut po Farmatsiya, Ministerstvo na Narodnotoo Zdrv e i. Sotsialnite Grizhi, Sofia, Bulgaria.
Trans. Bose Res. Inst.— Transactions of the Bose Research Institute. Calcutta.
Trav. Soc. Pharm. Montpellier — Travaux de la Societe de pharmacie de Montpellier.
Trudy bot. Inst. Akad. Nauk SSSR — Trudy Botanicheskogo instituta Akademy nauk SSSR. Moskva.
Trudy bot. Inst. im. V. L. Komarova Akad. Nauk SSSR — Trudy Botanicheskogo Instituta im. V. L. Komarova, Akademiya Nauk SSSR. Seriya 5. Rastitelnoe Syre.
Trudy kharkov. farm. Inst.— Trudy Kharkovskogo Farmatsevticheskogo Instituta. Kharkov, Ukr. SSR.
Trudy Khim. Prirod. Soedinenii, Kishinev. Gosudarst. Univ.— Trudy po Khimii Prirodnykh Soedinenii. Kishinevskii Gosudarstvennyi Universitet Kishinev, USSR.

Uchen. Zap. azerb. gos. Univ.— Uchenye Zapiski Azerbaid Zhanskogo gosudarstvennogo Universiteta. Baku.
Uchen. Zap. pyatigorsk. gos. farm. Inst.— Uchenye Zapiski Pyatigorskii Gosudarstvennyi Farmatsevticheskii Institut. Pyatigorsk USSR.
U.S. Dept. Agric., Agric. Res. Service A.R.S.— United States Department of Agriculture, Agricultural Research Service, ARS Series, Washington.
Univ. Rajputana Stud. med. Sect.— Rajputana University Studies: Medical Section. Jaipur.

Vest. Akad. Nauk kazakh. SSR — Vestnik Akademii nauk Kazakhskoi SSR. Alma-Ata.
Vikram — Vikram. Vikram University, Ujjain.

W. Afr. Pharm.— West African Pharmacist. Kumasi, London.

Yakugakuzasshi—Yakugakuzasshi. Tokyo.
Yao Hsueh Hsueh Pao — Yao Hsueh Hsueh Pao (Acta Pharmaceutica Sinica). Guozi Shudian, China.
Yao Hsueh T'ung Pao — Yao Hsueh T'ung Pao (Bulletin of Pharmacology: Pharmacy Reports: Yaoxue Tongbao) Guozi Shudian, China.
Yearb. Agric. U.S. Dep. Agric.— Yearbook of Agriculture. United States Department of Agriculture. Washington.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Z. Bot.— Zeitschrift fur Botanik. Jena.
Z. Naturf.— Zeitschrift fur Naturforschung. Wiesbaden. Tubingen.
Zesz. nauk. Politech. Lodz. Chem. Spozywcza — Zeszyty naukowe Politechniki lodzkiej Chemia spozywcza. Lodz.
Zh. obshch. Khim.— Zhurnal obshchei khimii Russkoe fizikokhimicheskoe obschestvo. Moskva.
Zh. prikl. Khim. Mosk.— Zhurnal prikladnoi khimii. Moskva.
Ziva — Ziva. Praha.

ABBREVIATIONS USED

Alk.	Alkaloid
aq.	aqueous
chem. compn.	chemical composition
compd.	compound
essen.	essential
ext.	extract
extn.	extraction
identn.	identificatior
sepn.	separation
sol.	soluble

Ass.	Assamese
B.	Bengali
Bo.	Bombay
G.	Gujarat
H.	Hindi
Kan.	Kannada
Kash.	Kashmir
M.	Marathi
M.P.	Madhya Pradesh
Mal.	Malayalam
Manip.	Manipur
P.	Panjabi
S.	Sanskrit
Tam.	Tamil
Tel.	Telugu
Turk.	Turkistan
U.P.	Uttar Pradesh

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

SUPPLEMENT TO GLOSSARY OF INDIAN MEDICINAL PLANTS

VERNACULAR NAMES, USES IN INDIGENOUS MEDICINE, CHEMICAL COMPOSITION AND DISTRIBUTION

(Asterisks denote plants which were not included in the Glossary 1956)

ABROMA (*Sterculiaceae*)

A. augusta Linn. f.

Leaves infusion given in gonorrhoea (NADKARNI, I, 4).

Roots—alk. abromine, a sterol and digitonide (*Indian J. Pharm.*, 1956, **18**, 472). Dried roots yield abromasterol A (*Pakist. J. sci. industr. Res.*, 1958, **1**, 305). Drug pharmacologically active in aq. exts. Its active constituents sol. in alcohol and water, not destroyed by alcohol. Drug more active than abromine-HCl, indicating that active principle is other than the alk. (*J. sci. Res. Banaras Hindu Univ.*, 1959-60, **9**, 1).

ABRUS (*Leguminosae*)

A. precatorius Linn.

English–*Jecquirity seeds.*

Seeds contain pectic substances (*Memor. Serv. chim. Etat.*, 1950, **35**, 61; *Chem. Abstr.*, 1952, 1218 *d*; *J. Formosan med. Ass.*, 1960, 868; *Biol. Abstr.*, 1961, 65720).

ABUTILON (*Malvaceae*)

A. indicum (Linn.) Sw.

Seeds yield raffinose 1·6% and semi-drying oil 9·21% consisting of linoleic, oleic, palmitic and stearic acids (*J. Indian chem. Soc.*, 1952, **29**, 451).

A. theophrastii Medic. syn. *A. avicennae* Gaertn.

Leaves contain rutin (0·01%) (*J. pharm. Soc. Japan*, 1956, 76, 347; *Chem. Abstr.*, 1956, 9688 *a*).

ACACIA (*Leguminosae*)

A. catechu Willd.

Gum consists of D-galactose (9 moles), L-arabinose (4 moles), D-rhamnose (3 moles) and L-glucuronic acid (3 moles). On hydrolysis the gum yields aldobiuronic acid found to be 6-D-glucuronoside-D-galactose (*J. Indian chem. Soc.*, 1956, **33**, 861); structure of degraded gum (*J. Indian chem. Soc.*, 1959, **36**, 31).

A. concinna DC.

Sapogenins of the seeds possess β-amyrine [*Arch. Pharm. Berl.*, 1955, **288**(60), 417].

A. intsia Willd. syn. *A. caesia* W. & A.

An amorphous powder obtained from the bark with all characteristics of a saponin (*Ann. pharm. franc.*, 1959, **17**, 422). A new triterpene alcohol, acaciol, isolated from the neutral genin fraction (*Arch. Pharm. Berl.*, 1961, **291**, 197; *Chem. Abstr.*, 1961, 14822 *b*). Bark contains 17% of tannin, stigmasterol and an aliphatic hydroxy compd. (*J. sci. industr. Res.*, 1962, **21B**, 345).

A. leucophloea Willd.

Fresh flowers contain myricetin, a flavonoid pigment (*J. sci. industr. Res.*, 1952, **11B**, 125).

ACHILLEA (*Compositae*)

***A. lanulosa** Nutt.; see **A. millefolium** Linn.

A. millefolium Linn. syn. *A. lanulosa* Nutt.

Dry plant collected in Ponitri contains no achilleine or any other alk. Hypotensive effect of the drug due to choline (*Chem. Zvesti*, 1956, **10**, 528; *Chem. Abstr.*, 1957, 6952 *f*).

Azulene content varies from 12 to 100 mg.% in flowers and only traces in leaves and stems (*Dissnes pharm., Warsz.*, 1956, **8**, 125).

Volatile oil consists of azulene 1·5%, comp. to pure synthetic guaiazulene; it is not active against certain types of skin diseases (*Farm. Glasn.*, 1957,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

13, 467; *Chem. Abstr.*, 1958, 7515 *a*). Correlation between the taxonomical position of sp. and its prochamazulene content (*Orv. Szle*, 1959, **5**, 308; *Chem. Abstr.*, 1960, 5009 *c*).

Essen. oil varies from 0·6 to 0·85%; chamazulene content 261-423 mg. % and choline content 0·3% (*Acta pharm. hung.*, 1960, **30**, 283; *Chem. Abstr.*, 1961, 7764 *h*).

The drug gives betonicine, L-(—)-stachydrine, betaine and a base C (*Arch. Pharm. Berl.*, 1960, **293**, 646; *Chem. Abstr.*, 1960, 23186 *h*); and free apigenin, a glucoside of apigenin and a glucoside of luteolin (*Dissnes pharm., Warsz.*, 1962, **14**, 347; *Chem. Abstr.*, 1963, **59**, 13712 *c*). Active principles: matricarin, diacetylmatricarin and two sesquiterpene lactones—isolation (*Tetrahedron Lett.*, 1963, 137; *Chem. Abstr.*, 1963, **59**, 670 *g*).

ACHRAS (*Sapotaceae*)

A. zapota Linn.

Bark possesses a water-sol. tuberculostatic principle (*Pharm. Acta Helvet.*, 1961, **36**, 97; *Chem. Abstr.*, 1961, 15831 *h*).

ACHYRANTHES (*Amaranthaceae*)

A. aspera Linn.

Chemical investigation of the whole plant (*J. Instn Chem. India*, 1957, **29**, 55). Seeds yield hentriacontane from petroleum ether ext. and saponin 2% from alcohol ext. (*J. sci. industr. Res.*, 1952, **11B**, 209), also oleanolic acid-oligosaccharide saponin (*J. sci. industr. Res.*, 1958, **17B**, 267). Oleanolic acid (sapogenin) 1·1% yield (*J. Indian chem. Soc.*, 1958, **35**, 693). Roots ext. gives oleanolic acid from the glycosidic fraction (*J. Indian chem. Soc.*, 1958, **36**, 529).

The drug used in renal dropsy and bronchial infections. Properties of sapogenin in seeds indicate identity with oleanolic acid (*J. sci. industr. Res.*, 1958, **17B**, 276).

A. bidentata Blume

Sapogenins of the seeds possess β-amyrine [*Arch. Pharm. Berl.*, 1955 **288** (60), 417].

ACONITUM (*Ranunculaceae*)

A. chasmanthum Stapf ex Holmes

Total alks. in 8 Indian varieties vary from 0·85 to 3·11%; in *A. chasmanthum* these are 2·98%. The standard official Indian variety 2·5% (*Indian J. Pharm.*, 1959, 163).

Two new alks. in the roots, chasmaconitine and chasmanthinine, their structure (*Canad. J. Chem.*, 1964, **42**, 154; *Chem. Abstr.*, 1964, **60**, 4179 *g*).

A. laeve Royle

Lappaconitine, 4·1% from dry tubers [*Planta Med.*, 1964, **12**(2), 177.]

A. napellus Linn.

Vitamin C contents [*Cienc. Med. Rio de J.*, 1963, **12**, 383]. Distribution of alks. in plants of different origin (*Ann. pharm. franc.*, 1960, **18**, 465; *Chem. Abstr.*, 1961, 3007 *d*).

Plants from mountainous regions richest in aconitine; toxicity due to compds. other than aconitine (*Ann. pharm. franc.*, 1960, **18**, 274).

A. soongaricum Stapf

English–*Jungar aconite*.

A new alk., monacetylsogorine (*Soviet Res. pharm. Chem.*, 1956, **11**, 543).

ACORUS (*Araceae*)

A. calamus Linn.

Alc. ext. of the plant has sedative and analgesic effects, moderate depression in blood pressure and respiration (*J. Amer. pharm. Ass.*, 1956, **45**, 655). Rhizome ext. and essen. oil effective against houseflies (*J. sci. industr. Res.*, 1956, **15C**, 6).

Calamus oil composition of (1) Jammu and (2) Kashmir roots (*Indian J. Pharm.*, 1957, 19, 183). Oil from Kashmir roots resembles European calamus oil. Consists of asarone 80·1%, calamenenol, calamene, ecgenol methyl ether and palmitic acid (*J. Proc. Oil Tech. Ass. India*, 1956, **11**, 31). Essen. oil from dried rhizomes (yield 1·5%) has anticonvulsant, antiveratrinic and antiarrhythmic action [*Arch. int. Pharmacodyn.*, 1960, **124**(1/2), 201; *Biol. Abstr.*, 1960, **35**, 54217].

Chemical investigation of Indian calamus oil (*Soap Perfum. Cosmet. Tr. Rev.*, 1964, **37**, 135).

A principle in the hydrocarbon fraction of the oil potentiates the sedative action of pentobarbital (*J. Pharm., Lond.*, 1959, **11**, 163). Hypnotic potentiating principles from the essen. oil by liquid-gas chromatography (*Nature, Lond.*, 1960, 466).

ACTAEA (*Ranunculaceae*)

A. spicata Linn.

New use as medicine in rheumatism, asthma, goitre (*Biol. Abstr.*, 1959, 11435).

ADHATODA (*Acanthaceae*)

A. vasica Nees

On destructive distillation the plant yields a liquid containing two bases with

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

antispasmodic properties, and the steam-distilled principle from the leaves possesses anthelmintic and weedicide properties of the drug (*Indian Pharm.*, 1954, **9**, 307).

Isolation of alk., vasicinone having a weaker bronchodilator action than adrenaline (*Nature, Lond.*, 1959, 184, Suppl. No. 17, 1317; *J. org. Chem.*, 1963, **28**, 445; *Chem. Abstr.*, 1963, **58**, 7985 *h*).

Seeds yield a fatty oil (25·6%), consisting of arachidic, behenic, lignoceric, cerotic, oleic and linoleic acids and sitosterol (*J. sci. industr. Res.*, 1956, **15B**, 612).

Oil from leaves, flowers and roots active against *Tubercle bacilli* (*Indian J. med. Res.*, 1954, **42**, 355).

AEGICERAS (*Myrsinaceae*)

A. corniculatum (L.) Blanco syn. *A. majus* Gaertn.

Contains saponin, a potent fish poison, 1·5% in fruits and 0·5% in barks and leaves (*Arch. Pharm. Berl.*, 1956, **289**, 221). Genin-A and isorhamnetin isolated from the bark (*J. Indian chem. Soc.*, 1959, 358).

AEGLE (*Rutaceae*)

A. marmelos Corr.

Leaves yield γ-sitosterol (*J. Indian chem. Soc.*, 1958, **35**, 194).

Fruits yield essen. oil containing *d*-α-phellandrene (*J. Indian Inst. Sci.*, 1953, **35**, 39); also yield allo-imperatorin and β-sitosterol (*J. Indian chem. Soc.*, 1957, **34**, 228; 1958, **35**, 194); its carbohydrate (*J. Indian chem. Soc.*, 1958, **35**, 25).

The heartwood contains a ferroquinoline alk., dictamine, a dihydrofurocoumarin, 'marmasin', and β-sitosterol (*J. Indian chem. Soc.*, 1959, **36**, 267).

AESCULUS (*Hippocastanaceae*)

A. hippocastanum Linn.

English–*Horse chestnut.*

Contains flavonic substances of value in treatment of circulatory venous disturbances (*Ann. pharm. franc.*, 1957, **15**, 124; *Chem. Abstr.*, 1957, 15066 *f*). Flavonoids of flowers and stems (*Arch. Pharm. Berl.*, 1959, **292**, 113; *Biol. Abstr.*, 1959, 14338).

Sepn. and identn. of escin, escigenin, flavones, esculin and esculetin (*Arzneimittel-Forsch.*, 1954, **4**, 213; *Chem. Abstr.*, 1954, 7849 *i*). Sugar portion of the saponin contains glucose, xylose and glucuronic acid (*Pharm. Acta Helvet.*, 1953, **28**, 265; *Chem. Abstr.*, 1954, 3631 *f*).

Paper chromatography method of demonstrating the saponin escin and the flavonal glycosides of seed exts. (*Pharm. Zentralh.*, 1959, **99**, 562; *Biol. Abstr.*, 1960, 60991). Structure of escin (*Arch. Pharm. Berl.*, 1960, **293**, 753; *Biol. Abstr.*, 1961, 77997).

Saponins in fruits (*Annals Acad. med. cracov.*, 1959, 273; *Biol. Abstr.*, 1961, 38598).

Flowers contain rutin, isoquercitrin, kaempferol-3-glucoside, a kaempferol-3-arabinoside and a kaempferol-3-rhamnoglucoside, but no quercitrine, which is present in the leaves [*Naturwissenschaften.*, 1955, **42**(7), 181; *Biol. Abstr.*, 1959, 11415].

AGAVE (*Amaryllidaceae*)

A. americana Linn.

Leaves from plants from India yield 0·065% of hecogenin (*Indian J. Chem.*, 1964, **2**, 297).

***A. cantala** Roxb.

S.–*Kantala*; Bo.–*Aloe.*

Leaves—contain steroid sapogenins (*Arch. Pharm. Berl.*, 1958, **286**, 317); hecogenin (*Bull. Calcutta Sch. trop. Med. Hyg.*, 1958, **6**, 60). Hecogenin, the principal sapogenin (0·15% yield), which can be recovered from sisal wastes after fibre sepn. (*Bull. Calcutta Sch. trop. Med. Hyg.*, 1958, **6**, 60; 1959, **7**, 5). Leaves also contain saponases suitable for conversion of Dioscorea saponin to diosgenin (*Bull. Calcutta Sch. trop. Med. Hyg.*, 1960, **8**, 59).

Naturalized in East and West Coast, upper Gangetic Plain and parts of Punjab, planted as a hedge.

***A. sisalana** Perr.

English–*Indian agave, Sisal.*

Hecogenin from sisal waste, which is used for making cortisone and material for manufacture of sex hormones (*Mfg Chem.*, 1955, **26**, 394; *Bull. Calcutta Sch. trop. Med. Hyg.*, 1959, **7**, 5). Hecogenin preparation by hydrolysing saponin (*Chem. & Ind.*, 1957, 1570). Hecogenin from sisal, source of steroids (2·3 g./kg.) (*An. Real Soc. Espan. Fis. Quim*, 1960, **56B**, 797).

Cultivated in Assam, Bengal, Bombay and in S. India.

AGLAIA (*Meliaceae*)

***A. diepenhorstii** Miq. syn. *A. odoratissima* Blume.

H.–*Priyangu, Gulphane*; G.–*Priyangu, Ghanwla*; M.–*Gawhla*; B.–*Gandhpryanyu*; Tel.–*Kodauduga, Ittauduga.*

Seeds give essen. oil containing aromadendrene, cineol, α-terpinene, citral, etc. (*J. Indian chem. Soc.*, 1955, **32**, 445).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Grows wild in Konkan, Karwar and other places in Western Ghats.

*A. odoratissima Blume; see A. diepenhorstii Miq.

AGRIMONIA (*Rosaceae*)

A. eupatoria Linn.
English–*Agrimony*.
Chem. compn. of the Chinese native drug (*Chem. Abstr.*, 1961, 19135 *a*).

AILANTHUS (*Simarubaceae*)

A. altissima (Mill.) Swingle
Aq. ext. of the leaves contains a substance toxic to other tree seedlings (*Bot. Gaz.*, 1959, 32; *Biol. Abstr.*, 1960, 39212).

A. excelsa Roxb.
Chemical examination of the bark shows the presence of triacontane, hexatriacontane and a non-glycosidal bitter, excelsin (*Indian J. Pharm.*, 1959, 143). The bark with light petroleum yields β-sitosterol, 2,6-dimethoxyhenzoquinone and malanthin; and with ethanol, a bitter principle (*Indian J. Chem.*, 1964, **2**, 40).

A. malabarica DC.
Yields an aromatic resin (*Wlth India*, I, 41).
Bark contains a non-glucosidal bitter, malanthin (*J. sci. industr. Res.*, 1952, **11B**, 124).

AJUGA (*Labiatae*)

A. bracteosa Wall. ex Benth.
The plant yields ceryl alcohol, β-sitosterol, γ-sitosterol, cerotic and palmitic acids and a glucosidic constituent (*J. sci. industr. Res.*, 1961, **20B**, 185).

ALANGIUM (*Alangiaceae*)

A. salvilfollum (Linn. f.) Wang. syn. *A. lamarckii* Thwaites
Seed kernels contain 'Alamarckine', the alkaloidal constituent (*J. sci. industr. Res.*, 1956, **15B**, 432; *J. Indian chem. Soc.*, 1957, 629). Chemical examination of the stem-bark (*Ann. Biochem.*, 1960, **20**, 103). From root-bark emetin, cephaeline and psychotrine and an alk. recovered (*Indian J. Chem.*, 1964, **2**, 379, 468) and an alk., AL 64. Fruits yield two alks. (*Curr. Sci.*, 1964, 745).

ALBIZZIA (*Leguminosae*)

A. amara Boivin
Seeds yield a sapogenin, echinocystic acid (*J. sci. industr. Res.*, 1962, **21B**, 347).

A. lebbeck Benth.
The saponin mixture from the seeds from Uttar Pradesh yield oleanolic acid and echinocystic acid (*Bull. Soc. chim. Fr.*, 1957, 1440). The beans yield albigenic acid, an isomer of echinocystic acid (*Tetrahedron*, 1959, 19; *Sci. & Cult.*, 1958, 435). Gum, chemical examination (*J. sci. industr. Res.*, 1962, **21B**, 454).
Saponins and sapogenins in flowers (*Canad. J. Chem.*, 1961, 1721).

A. odoratissima Benth.
Dark brown insoluble gum in the form of tears (*Wlth India*, I, 44).
Hydrolysing the saponins from seeds from Maharashtra yields two triterpenic acids and machacrinic acid (*J. pharm. Sci.*, 1961, 923; 1962, 923). Seeds from Uttar Pradesh yield a new saponin, odoratissimin (*J. sci. industr. Res.*, 1962, **21B**, 30).

A. procera (Roxb.) Benth.
Saponin and sapogenin from the seeds (*Arch. Pharm. Berl.*, 1959, **292**, 57, 62).

ALECTRA (*Scrophulariaceae*)

***A. parasitica** A. Rich
Used in Ayurvedic medicine for skin diseases. Rhizomes contain azafrin and flowering stem contains mannitol (*Curr. Sci.*, 1964, 174). Parasitic plant on the roots of *Vitex negundoo*.
Found at Chikrakut, Banda, U.P.

ALLAMANDA (*Apocynaceae*)

A. cathartica Linn.
Leaves yield ursolic acid (*J. chem. Soc.*, 1954, 2782).

ALLIARIA (*Cruciferae*)

A. officinalis Andrzej.
Plant yields juice having inhibitory action on *Bacillus pyocyaneum* and on Gram-negative bacteria of typhoid-paratyphoid-enteritis group [*J. Hyg. Epidem. Microbiol. Immun.*, 1957, 1(2), 213; *Biol. Abstr.*, 1959, 7395].

ALLIUM (*Liliaceae*)

A. ampeloprasum Linn.
Bulbs contain alliin (0·4%) and also show the presence of alanine, arginine, aspartic acid, asparagine, histidine, leucine, methionine, phenylalanine, proline, serine, threonine, tryptophan and valine (*Curr. Sci.*, 1961, **30**, 338).

A. cepa Linn.
Hypodermic injection of 2 ml. pressed juice/kg. wt of rabbits increases diuresis from 13 to 26 ml./day (*Med. trop.*, 1951, **11**, 622); active principle glycollic acid.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Pure quercetin is obtained from onion skins (*Farm. Polska*, 1961, **17**, 259; *Chem. Abstr.*, 1962, 7425 *g*). Flavonoid and other phenolic compds. from dry brown outer scales as well as the fleshy scales (*Arch. Pharm. Berl.*, 1958, **291** (5), 238; *Biol. Abstr.*, 1959; 23384). Phenolic acids of different parts of the plant (*Curr. Sci.*, 1964, 471); sugar components (*Curr. Sci.*, 1959, 196).

A. sativum Linn.

English–*Garlic.*

Essen. oil—Bromometric method of estimation most accurate (*Dissnes pharm. Warsz.*, 1952, **4**, 95; *Chem. Abstr.*, 1954, 11721 *b*).

Chem. compn. consists of alliin, 1·0% in red variety and 0·8% in white, besides all other compds. found in *A. ampeloprasum*. Occurrence of amino acids and alliin in Indian alliums (*Curr. Sci.*, 1961, **30**, 338).

The plant produces inhibitory effects on Gram-negative germs of typhoid-paratyphoid-enteritis group [*J. Hyg. Epidem. Microbiol. Immun.*, 1957, **1**(2), 213; *Biol. Abstr.*, 1959, 7395]. Both *A. sativum* Linn. and *A. aflatunense* B. Fedtsch. possess outstanding germicidal properties, all cultures destroyed under their influence (*Dokl. Akad. Nauk uzbek. SSR*, 1959, No. 1, 43; *Chem. Abstr.*, 1960, 7067 *i*).

ALOCASIA (*Araceae*)

A. macrorrhiza Schott

English–*Giant taro.*

Rhizomes contain glucose, fructose, a phytosterol-like compd. and an alk. (*Chem. Abstr.*, 1958, 4104 *g*).

ALPINIA (*Zingiberaceae*)

A. galanga Willd.

English–*Greater galangal.*

Rhizomes of the greater galangal contain no flavones, whereas the rhizomes of *A. officinarum*, called the lesser galangal, contain flavones, viz. kaempferide, galangin and alpinin. This is an important feature in distinguishing the two galangals (*Indian J. Pharm.*, 1961, 76).

Essen. oil contains $C_{10}H_{30}$ hydrocarbon similar to one from *Piper longum* (*Riechstoffe Aromen*, 1963, **13**, 293, 357; *Chem. Abstr.*, 1964, **60**, 5271 *e* and 1533 *h*).

Both species extensively cultivated in Bengal and N. India.

ALSTONIA (*Apocynaceae*)

A. scholaris R. Br.

English–*Devil tree.*

Dita bark is of value as a febrifuge. Extn. of total alks. [*Bull. Calcutta Sch. trop. Med. Hyg.*, 1954, **1**(4), 6]. A water-sol. alk. [*Bull. Calcutta Sch. trop. Med. Hyg.*, 1955, **3**(4), 165].

α-Amyrin and lupeol, the major triterpenes of the bark [*Experientia*, 1957, **13**(7), 277]. Triterpenes (*J. Indian chem. Soc.*, 1960, 637).

A. venenata R. Br.

Isolation from bark of alstovenine, an indole alk. (*J. Indian chem. Soc.*, 1963, **40**, 1043; 1964, **41**, 638). Chemistry, venenatine (0·09%) and isovenenatine (0·001%) [*Tetrahedron Lett.*, 1964 (15), 901; *Chem. Abstr.*, 1964, **60**, 15926 *f*].

ALTHAEA (*Malvaceae*)

A. rosea Cav.

Flowers yield a flavonoid, cyanidin (*Curr. Sci.*, 1964, 431).

AMMI (*Umbelliferae*)

***A. visnaga** Lam.

English–*Honey plant.*

Review covering history, chemistry and pharmacology of Khellin (*Pharm. Zentralh.*, 1953, **92**, 232). Visnagans and khellactones—composition [*Experientia*, 1956, **12**(4), 137; *Biol. Abstr.*, 1960, 30165]. Khellin (*Arch. Pharm. Berl.*, 1957, **290**, 396; *Chem. Abstr.*, 1958, 655 *f*). A new furocoumarin, isopimpinellin, isolated from the fruit (*Planta Med.*, 1961, **9**, 200; *Chem. Abstr.*, 1961, 21481 *i*).

The active constituent, visnammin (Khillin) and visnagin in angina pectoris and spasm. Khellin from fruits used in treatment of coronary insufficiency and bronchial asthma [*Pchelovodstvo*, 1960, **37**(3), 23; *Biol. Abstr.*, 1961, 35304].

Indigenous to Mediterranean region, cultivated in India.

AMOMUM (*Zingiberaceae*)

A. subulatum Roxb.

Legal standards for whole cardamom: ash 5·49-6·05, acid insol. 0·27-0·43, volatile oil 0·50-0·81-1·50%. For seeds: ash 3·45-3·95-4·57%, acid insol. 0·31-0·67-1·30%, volatile oil 0·90-1·34-2·00% [*J. Instn Chem. India*, 1959, **31**(5), 230; *Biol. Abstr.*, 1960, 45688]. Volatile oil in cardamom seeds 1·0-4·8% in commercial samples (*Proc. Okla. Acad. Sci.*, 1963, **43**, 57; *Chem. Abstr.*, 1964, **60**, 7867 *b*). Essen. oil isolation and characterization (*Indian Perfumer*, 1961, **5**, 30).

ANACARDIUM (*Anacardiaceae*)

A. occidentale Linn.

Hypoglycemic effects of decoction of plant on normal rats and dogs (*Ann.*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Fac. Med. Univ. Recife, 1959, 351; *Biol. Abstr.*, 1961, 46306).

Pericarp juice of shells yield kajidin (ellagic acid) (*Indian J. Chem.*, 1964, **2**, 253); phenolic constituent of shell liquid (*Indian J. Chem.*, 1964, **2**, 337; *Proc. Pacif. Sci. Congr. Bangkok*, 1957, **5**, 63; *Chem. Abstr.*, 1964, **60**, 9096 *f*).

ANANAS (*Bromeliaceae*)

A. comosus Merr. syn. *A. sativus* Schult f.

Leaves significantly anthelmintic (*J. Indian med. Ass.*, 1963, **41**, 435).

ANDROGRAPHIS (*Acanthaceae*)

A. paniculata Nees

Studies in Kalmegh ext. (*Indian J. Pharm.*, 1959, **21**, 168). Estimation of andrographolid in the ext. spectrophotometrically (*Indian J. Pharm.*, 1963, **25**, 225).

ANEMARRHENA (*Liliaceae*)

***A. asphodeloides** Bunge

Rhizomes contain 6% saponin; hydrolysis yields 2 steroidal sapogenins (*J. pharm. Soc. Japan*, 1953, **73**, 29; *Chem. Abstr.*, 1953, 4043 *a*).

Found in India and China.

ANETHUM (*Umbelliferae*)

***A. graveolens** Linn.

English–*Dill*.

Chem. compn. of dill oil (*Indian J. Pharm.*, 1957, 76; *Indian Oil Soap J.*, 1963, **28**, 274).

Indigenous to S. Europe but cultivated in Jammu and Kashmir.

A. sowa Kurz

Seeds in the early period of formation contain 5·62% of essen. oil; the oil from ripe seeds contains 50% carvone and 47% limonene (*Trudy kharkov. farm. Inst.*, 1957, No. 1, 190). Indian dill oil contains carvone 30%, limonene 34·4%, *l*-dihydrocarvone 0·1%, dillapiol 18·9% (*Indian Pharm.*, 1954, **9**, 218). Carvone analysis by ultraviolet absorption (*Curr. Sci.*, 1960, **29**, 345).

ANGELICA (*Umbelliferae*)

A. archangelica Linn. syn. *Archangelica officinalis* Hoffm.

Yield and quality of the essen. oil depend on the location of natural growing plant; higher the altitude, the better the yield and aroma (*Dissnes pharm., Warsz.*, 1950, **2**, 1; *Chem. Abstr.*, 1951, 7304 *b*). Nine coumarins isolated from root including a new coumarin called archicin [*Arch. Pharm. Berl.*, 1956, **289**(61), 81]. Estimation of phellandrene chromatographically in the seed and root oils [*Indian Perfumer*, 1960, **4**(1), 21].

Essen. oil from ripe fruits (*Dissnes pharm., Warsz.*, 1963, **15**, 35; *Chem. Abstr.*, 1964, 5271 *d*; *Indian Oil Soap J.*, 1960, **26**, 130).

A. glauca Edgw.

Dried roots of plants in Jammu and Kashmir yield an essen. oil, 0·4%. It contains lactones, sesquiterpenes, as also *d*-α-cadinene, umbelliprenin and a terpene alcohol (*Indian Soap. J.*, 1959, **24**, 288). Composition of the root oil from plants growing wild in Jammu and Kashmir (*Indian J. Pharm.*, 1958, 107).

ANISOMELES (*Labiatae*)

A. malabarica R. Br.

Isolation of triterpenic acid, identified as betulinic acid (*J. sci. industr. Res.*, 1962, **21B**, 507).

ANNONA (*Annonaceae*)

A. reticulata Linn.

Constitution of reticulin, a new alk., containing 2 phenolic hydroxyl groups from root-bark [*Chem. Ber.*, 1959, **92**(4), 776; *Chem. Abstr.*, 1959, 15112 *d*].

A. squamosa Linn.

Green leaves yield pleasant-smelling essen. oil (0·08%) (*J. Indian Inst. Sci.*, 1954, **36A**, 117). Seeds potent insecticide (*Indian J. Ent.*, 1955, 165).

ANOGEISSUS (*Combretaceae*)

A. latifolia Wall.

Glucoside isolation from leaves (*Bull. cent. Leath. Res. Inst., Madras*, 1960, 529). Isolation and constitution of a gallotannin (*Aust. J. Chem.*, 1964, **17**, 238; *Chem. Abstr.*, 1964, **60**, 14577 *e*).

ANTHEMIS (*Compositae*)

A. nobilis Linn.

Flowers yield maximum amount of volatile oil 5·25%, which contains esters, acids, alcohols, anthemol and azulenes. Seasonal variation of the oil content (*Ziva*, 1959, **7**, 94; *Chem. Abstr.*, 1960, 3863 *c*).

Xylene method of azulene estimation [*Dissnes pharm., Warsz.*, 1957, **9**(3), 237].

ANTHISTIRIA (*Gramineae*)

***A. arguens** Willd. syn. *Themeda arguens* (L.) Hack.

Pulped plant said to be applied as a poultice on the hips for lumbago in Java.

Andaman Islands.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ANTHOCEPHALUS (*Rubiaceae*)

A. indicus A. Rich. syn. *A. cadamba* Miq.

Essen. oil, preparation from flowers, yield and constituents (*Perfum. essent. Oil Rec.*, 1954, **45**, 80). Bark contains alks., steroids, fats and reducing sugars (*Indian J. Pharm.*, 1960, 172; 1961, 5).

ANTIARIS (*Moraceae*)

A. toxicaria (Pers.) Lesch.

The milky sap contains cardiotonic glycoside corresponding to antiarin [*J. pharm. Soc. Japan*, 1944, **64**(11A), 67; *Chem. Abstr.*, 1951, 3561 *a*].

APIUM (*Umbelliferae*)

A. graveolens Linn.

Psoralen, xanthotoxin, angelicin and bergapten are obtained from edible vegetable matter, all with photodynamical activity. Bergapten is responsible for skin disorders among the cultivators (*Gazz. chim. ital.*, 1954, **84**, 870; *Chem. Abstr.*, 1955, 7188 *a*).

Seeds contain 10% of insol. carbohydrates and 0·8% of an essen. oil (*Indian J. Pharm.*, 1960, 232).

AQUILARIA (*Thymelaeaceae*)

A. agallocha Roxb.

Essen. oil (*Soap Perfum. Cosmet.*, 1952, **25**, 169; *Indian Soap J.*, 1953, **18**, 268). Studies on *A. agallocha*—a review (*Koryo*, 1960, No. 58, 11; *Chem. Abstr.*, 1961, 12771 *c*).

ARACHIS (*Leguminosae*)

A. hypogaea Linn.

English–*Groundnut.*

Constitution of leucocyanidin of the nut (*Curr. Sci.*, 1960, 178).

Alk. arachine from the press-cake pellets, is actually impure choline (*Planta Med.*, 1961, **9**, 213; *Chem. Abstr.*, 1962, 541 *c*). Subcellular fractions of seeds, proteins, etc. (*J. Fd Sci.*, 1962, **27**, 321). Detection and estimation of aflatoxin in nuts (*Analyst*, 1964, **88**, 209, 214; **89**, 436).

ARALIA (*Araliaceae*)

***A. quinquefolia** Decne. & Planch. syn. *Panax ginseng* C. A. Mey.

English–*Asiatic* or *Chinese ginseng.*

Roots contain essen. oil, resin saponin and bitter principle. Tonic, stimulant, restorative, alterative, demulcent. The drug stimulates central nervous system and respiration, which is ascribed to two glucosides, panoxcid A and B. Besides, an alk., vitamin B complex and steroidal hormones isolated.

Roots yield choline 0·1-0·2% by wt. (*Chem. pharm. Bull. Tokyo*, 1963, **11**, 1342; *Chem. Abstr.*, 1964, **60**, 3946 *f*). Yield β-sitosterol (*Pharm. Ztg. Ver. Apotheker-Ztg*, 1961, **106**, 1307; *Chem. Abstr.*, 1965, **62**, 397 *f*).

It is used as a tonic and in rejuvenation preparations. These properties have cosmetic applications (*Am. Perfumer*, 1961, **76**(10), 29; *Chem. Abstr.*, 1962, 1525 *b*).

A review (*Pharmazie*, 1958, **13**(9), 556; *Biol. Abstr.*, 1959, 23378).

The plant does not occur in India but ginseng roots are probably imported (*Wlth India*, VII, 215).

China, Japan and adjacent countries.

ARCTOSTAPHYLOS (*Ericaceae*)

A. uva-ursi Spreng.

Determination of 'arbutin' in the leaves (5·3-9·2%) (*Pharm. Zentralh.* 1959, **98**, 371; *Biol. Abstr.*, 1960, 60990).

ARECA (*Palmae*)

A. catechu Linn.

English–*Arecanut.*

Arecoline, a substitute for pilocarpine HCl in ophthalmic treatment (*J. pharm. Soc. Japan*, 1944, **64**, No. 11A, 67; *Chem. Abstr.*, 1951, 3561 *a*). The taeniacidal actions due to principles other than alks. (*J. Amer. pharm. Ass.*, 1962, **41**, 336).

Nuts—β-sitosterol (*Indian J. agric. Sci.*, 1936, **26**, 401). Leucocyanidins of the nuts (*J. sci. industr. Res.*, 1961, **20B**, 615). The tannins show antibacterial and antifungal properties; found to be spasmogens of rats' uteri under influence of progesterone (*Indian J. Pharm.*, 1964, **26**, 269).

Important characteristics of nuts (*Curr. Sci.*, 1959, 198). A review (*Econ. Bot.*, 1958, **12**, 315).

ARGEMONE (*Papaveraceae*)

***A. alba** Lestib.

Roots and aerial parts contain alks., α-allocryptonine, β-allocryptonine, berberine, sanguinarine-chelerythrine mixture, etc. In alkaloidal content *A. alba* is very similar to *A. mexicana* (*Colln Czech. chem. Commun. Engl. Edn*, 1960, **25**, 756; *Chem. Abstr.*, 1961, 13552).

Runs wild in India.

A. mexicana Linn.

Seeds—modification in the method of fractionation. Fractions that do not elute and that eluted by C_6H_6 are the most toxic to mice (*Bull. Calcutta Sch. trop. Med. Hyg.*, 1954, **2**, No. 2, 41). Occurrence of 'ceryl alcohol' (*J. Indian chem. Soc.*, 1966, **33**, 351). Contains

Digitized by Arya Samaj Foundation Chennai and eGangotri

several alks., principally protopine (0·033%) and allocryptonine (0·068%), two to three times in the roots (*Ciencia, Mex.*, 1959, **19**, 67). Alks. total yield 0·125%—protopine 0·084% and berberine 0·125%—their pharmacological effects, it contains tannin resin and argemone oil with a toxic principle (*J. pharm. Sci.*, 1963, **52**, 1172; *Chem. Abstr.*, 1964, 192).

ARISAEMA (*Araceae*)

A. tortuosum (Wall.) Schott syn. *A. curvatum* Kunth
English–*Snake plant.*
Used medicinally in Kumaon region; contains malic acid (*Agra Univ. J. Res.*, 1960, 175).

ARISTOLOCHIA (*Aristolochiaceae*)

A. bracteata Retz.
Aristolochic acid and aristo-red are the two crystalline principles of the root; they are also present in the seeds in minute quantities (*J. sci. industr. Res.*, 1959, **18B**, 245).

A. indica Linn.
Essen. oil recovered from roots (0·52%) (*J. Indian Inst. Sci.*, 1955, **37A**, 266).

A. reticulata Nuttal.
Chemistry of ligroin-soluble fraction (*J. Pharm.*, 1954, **6**, 1005).

ARNICA (*Compositae*)

A. montana Linn.
Review of the drug (*Pharmazie*, 1953, **8**, 179, 286, 340).
Flowers yield three new substances: carnaubyl alcohol, stearine m. 131·5°, and stearine m. 227·8° besides paraffins, faradiol and arnidendiol (*Arch. Pharm. Berl.*, 1956, **289**, 75; *Chem. Abstr.*, 1956, 10983 *c*). The benzene ext. of drug yield an alc. $C_{24}H_{50}O$ and two new sterols (*Arch. Pharm. Berl.*, 1956, **289**, 75). New components of the roots (*Arch. Pharm. Berl.*, 1963, **296**, 273; *Chem. Abstr.*, 1964, 3946 *d*).

ARTEMISIA (*Compositae*)

A. absinthium Linn.
Constitution of artemisetin (*Arch. Pharm. Berl.*, 1957, **290**, 37; *Biol. Abstr.*, 1958, 28445).

A. annua Linn.
Plant yields essen. oil of agreeable, refreshing and slightly balsamic odour; constants (*Perfum. essent. Oil Rec.*, 1955, **46**, 75).

***A. brevifolia** Wall.; see **A. maritima** Linn.

A. dracunculus Linn.
The herb contains coumarins, probably 6,7-dimethoxy and 7-methoxycoumarin (*Sci. pharm.*, 1953, 21; *Chem. Abstr.*, 1956, 13601 *f*).

***A. fragrans** Willd.; see **A. maritima** Linn.

A. maritima Linn. syn. *A. brevifolia* Wall., *A. fragrans* Willd., and *A. spicigera* C. Koch.
There are two varieties of this plant, *Neercha* and *Seski*, the latter yielding more oil than the former.
Santonin, β-santonin and pseudosantonin, extn. and changing of the latter two into santonin (*Arch. Pharm. Berl.*, 1955, **288**, 336; *Chem. Abstr.*, 1957, 6941 *i*). Extn. of santonin (*J. Indian chem. Soc. industr. Edn*, 1957, **20**, 148; *Japan Pat.* 2448, 154). Estimation of santonin in plants (*Chem. Zvesti*, 1958, **12**, 102; *Chem. Abstr.*, 1958, 10499 *c*).
Essen. oil from *A. brevifolia*, containing carboxylic acids, with four 7 C atoms, camphene, cineole, thujone and (−)-camphor, together with *p*-cymene and possibly α- and β-thuja-ketonic acids. Essen. oil from *A. fragrans*, yield 0·5-0·8% and alks. 0·41% (*Dokl. Akad. Nauk. Azerb. SSR*, 1955, **11**, 553; *Chem. Abstr.*, 1956, 10341 *a*).
Essen. oil in *A. spicigera* from Azerbaidzhan 0·9-1·0% and alks. 0·26% (*Dokl. Akad. Nauk. Azerb. SSR*, 1955, **11**, 553; *Chem. Abstr.*, 1956, 10341 *a*).

***A. nilagarica** (Clarke) Pamp. syn. *A. vulgaris* auct-non. Linn. syn. *A. vulgaris* var. *nilagarica* C. B. Clarke
H.–*Nagdona*; Tam.–*Machipatri.*
Herb—vermifuge
Leaves and flower tops are used in asthma.
Found throughout India.

A. persica Boiss.
Essen. oil contains *d*-β-pinene, borneol, borneol esters, camphene, phenols and alcohols (*Izv. Akad. Nauk. Kazakh. SSR*, 1956, No. 9, 504; *Chem. Abstr.*, 1956, 9693 *e*).

***A. roxburghiana** Bess. syn. *A. grata* Wall.
Essen. oil of the plant, yield 0·5% (*Parfum. Kosmetik*, 1963, **44**, 43; *Chem. Abstr.*, 1963, **61**, 13705 *g*).
Himalayas.

A. scoparia Waldst. & Kit.
Essen. oil (yield 0·6%), noted for its odour. Physical data and chem. compn. (*Indian Pharm.*, 1963, **8**, 257).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

***A. spicigera** C. Koch. syn. *A. fragrans* Willd.; see **A. maritima** Linn.

A. vulgaris Linn.

Essen. oil and its cineole contents highest in the efflorescence of the plant; cineole up to 30% in the oil of fresh and dried shoots (*Dissnes pharm., Warsz.*, 1960, **12**, 211). Essen. oil (0·34%) compds. similar to oil from *A. absinthium* (*Parfum. Kosmetik*, 1964, **45**, 63; *Chem. Abstr.*, 1964, **61**, 529 *e*).

ARTOCARPUS (*Moraceae*)

A. heterophyllus Lam. syn. *A. integrifolia* Linn. f.

Acetylcholine in seeds in midribs of leaves and in whole leaves (*Brit. J. Pharmacol.*, 1955, **10**, 247).

Colouring matters of the wood, artocarpin and artocapanone, a flavone and a flavanone respectively (*J. sci. industr. Res.*, 1960, **19B**, 470; 1961, **20B**, 112).

A. lakoocha Roxb.

Wood contains polyhydric phenolic compound, 2:4:3′:5′-tetrahydroxystilbene (*J. chem. Soc.*, 1957, 2231). Stem-bark yields two crystalline triterpenes, lupeol and β-amyrin acetate (*J. sci. industr. Res.*, 1960, **19B**, 498).

ASARUM (*Aristolochiaceae*)

A. europaeum Linn.

Essen. oil in the pith of rhizomes, strongly refractive particles (*Z. Bot.* 1952, **40**, 53; *Chem. Abstr.*, 1954, 956 *g*).

Essen. oil from the fresh plant contains 50% asarone, 65% more toxic than peppermint oil. Essen. oil is the emetic and expectorant principle of the plant and of value in digestive tract lesions, silicosis, dry pharyngeal and laryngeal catarrh, etc. (*Pharmazie*, 1956, **11**, 63; *Chem. Abstr.*, 1957, 671 *d*).

ASCLEPIAS (*Asclepiadaceae*)

A. curassavica Linn.

English–*Silk-weed*.

Commercial utilization in chemical, pharmaceutical, agricultural and textile fields. The plant is toxic and laxative to animals due to its glycoside (*Rev. Quim. industr. Rio de J.*, 1955, **24**, 154; *Chem. Abstr.*, 1956, 4454 *g*). The leaves exts. yield 3 cardioactive glucosides. One of them, asclepiaside D, more potent; the LD_{50} 0·6 mg./kg. (*Anais Acad. bras. Cienc.*, 1959, 421; *Biol. Abstr.*, 1960, 39410).

ASPARAGUS (*Liliaceae*)

A. adscendens Roxb.

The plant contains sarsapogenin (saponins or sapogenins) in a yield of 1-1·4 g./kg. drug (*Indian J. Pharm.*, 1952, **14**, 131).

gonocladus Baker and **A. racemosus** Willd.

Sarsapogenin (saponins or sapogenins) in a yield of 1-1·4 g./kg. drug (*Indian J. Pharm.*, 1952, **14**, 131).

ASPHODELUS (*Liliaceae*)

A. fistulosus Linn.

Composition of the oil (*J. Amer. Oil Chem. Soc.*, 1961, 452; *Biol. Abstr.*, 1962, 10998).

A. tenuifolius Cav.

Linoleic acid rich oils, their therapeutic value in preventing atherosclerosis; screening of seed oils (*Indian J. Pharm.*, 1964, **26**, 80).

ASTERACANTHA (*Acanthaceae*)

A. longifolia (L.) Nees syn. *Hygrophila spinosa* T. Anders.

Isolation of alks. and lupeol from the whole plant (*Indian J. Pharm.*, 1952, 212; *J. Indian chem. Soc.*, 1957, 882).

Seeds — isolation of Asterol I, II, III and IV and asteracanthine and asteracanthicine (*Indian J. Pharm.*, 1952, 282, 285).

ATALANTIA (*Rutaceae*)

A. monophylla Corr.

Physical and chemical data of the essen. oil (wild lime oil) from the leaves (*J. Indian chem. Soc.*, 1951, **28**, 713).

ATROPA (*Solanaceae*)

A. belladonna Linn.

Total alk. content depends upon stage of development of plant, low during flowering, very high when bearing green berries (*Euphytica*, 1956, **5**, 259; *Chem. Abstr.*, 1957 15891 *b*). Alk. content in leaves is influenced by plant spacing—30 cm. spacing gives 12·2% more alk. than in no spacing (*Biul. Inst. Rosl. lecz.*, 1957, **3**, 87; *Chem. Abstr.*, 1958, 1548 *i*). Alkaloidal content; seasonal variation (*Pharm. Zentralh.*, 1956, **95**, 437; *Biol. Abstr.*, 1957, 15172).

Alk. content estimation—50-250% increase is achieved by pulverizing the raw material and sifting the stalks (*Orv. Szle*, 1959, **5**, 306). Extn. of hyoscyamine by avoiding isomerization to atropine (*Boll. Soc. eustach. inst. sci. Univ. Camerino*, 1954, **47**, 191; *Chem. Abstr.*, 1955, 13599 *f*). Alk. contents or therapeutic value of var. *flava*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

0·16-0·55% (*Dissnes pharm., Warsz.*, 1956, **8**, 319; *Chem. Abstr.*, 1957, 10840 *d*).

Cuscohygrine, a new normal alk. (*Nature, Lond.*, 1954, **174**, 833; *Chem. Abstr.*, 1955, 5780 *d*). Bellardine, an alk., is obtained from germinating seeds and seedlings, where usual alks., hyoscyamine, scopolamine, apostropine, belladonine or tropine all absent (*Nature, Lond.*, 1954, **173**, 692).

AZADIRACHTA (*Meliaceae*)

A. indica A. Juss.

Bitter constituents from root and trunk bark (*Indian Pat.* 46967, 1954). The bitter constituent, nimbin molecule contains an acetoxy, a lactone, an ester, a methoxy and an aldehyde group (*J. sci. industr. Res.*, 1956, **15B**, 425).

Antibacterial principle in leaf ext. [*J. vet. Res.*, 1957, **2**(1), 45].

BACOPA (*Scrophulariaceae*)

B. monnieri (Linn.) Pennell syn. *B. monniera* Wettst.; *Herpestis monniera* (Linn.) H.B. & K.

The creeper is used in the treatment of insanity and epilepsy and as a potent nervetonic, cardiotonic and diuretic. Presence of betulic acid, a saponin (*J. sci. industr. Res.*, 1960, **19B**, 456); a saponin, hersaponin (*Indian J. Pharm.*, 1959, 303). Occurrence of stigmasterol in free state (*Bull. Calcutta Sch. trop. Med. Hyg.*, 1963, **11**, 57).

Hersaponin, active principle, resembles reserpine and chlororomazine in its central action [*Fed. Proc.*, 1961, **20**(1), 322; *Biol. Abstr.*, 1961, 60521].

BALANITES (*Simarubaceae*)

B. aegyptiaca (Linn.) Delile syn. *B. roxburghii* Planch.

Used in Sudan and Egypt as tonic, laxative and stomachic, also in asthma, renal diseases and hypertension.

Seeds contain saponin, a fish-poison. Sapogenin is diosgenin (*J. Indian chem. Soc.*, 1951, **28**, 588).

Physiological studies—seed ext. used clinically as a hypotensive active principle (*Indian J. med. Res.*, 1960, 589).

BALDINGERA (*Gramineae*)

***B. arundinaceae** Dum.; see **Phalaris arundinacea** Linn.

BARRINGTONIA (*Lecythidaceae*)

B. acutangula (Linn.) Gaertn.

Saponin in leaves and bark 1·2% and in seeds 5% (*Arch. Pharm. Berl.*, 1956 **289**, 140; *Chem. Abstr.*, 1956, 12401 *c*). Sapogenins, acutagenol A and acutagenol B (*Sci. & Cult.*, 1957, **22**, 516).

The plant contains three triterpenoid sapogenols, barringtogenol B, barringtogenol C and barringtogenol D, and two triterpenoid acid sapogenins, isolated through their esters (*J. pharm. Sci.*, 1961, **50**, 937). Isolation of a triterpenic dicarboxylic acid (*Indian J. Chem.*, 1964, **2**, 463).

B. racemosa (Linn.) Roxb.

Seeds contain 3% of saponin (*Arch. Pharm. Berl.*, 1956, **289**, 140). Barringtonin, a new crystalline saponin isolated from the fruits and identified [*Bull. cent. Res. Inst., Univ. Kerala*, 1959, **A6**(1), 15].

BAUHINIA (*Leguminosae*)

B. variegata Linn.

Agglutinating activity of seed ext. for human blood (*Econ. Bot.*, 1960, 232).

BERBERIS (*Berberidaceae*)

B. aristata DC.

Bark contains two alks., palmatine chloride and palmatine and berberine chlorides mixture (*J. sci. industr. Res.*, 1950, **9B**, 306). Berberine not vibriocidal, but prevents the death of cholera-infected rabbits when given early, better than sulphaguanidine (*Indian J. med. Res.*, 1962, **50**, 5).

B. asiatica Roxb. ex DC.

Root, bark and stem from Kashmir, Garhwal, Kumaon, Dehra Dun, Nepal and Darjeeling yield berbamine, berberine, palmatine and jatrorrhizine from their exts. (*J. Indian chem. Soc.*, 1954, **31**, 83).

***B. lamberti** Parker

H.–*Kangora*.

Roots contain alks. oxycanthine, berbamine, berberine, palmatine, jatrorrhizine and columbamine and two new alks., lambertine and berlambine (*J. Indian chem. Soc.*, 1953, **30**, 705).

Kumaon and Nepal border up to 2500 m.

***B. thunbergii** DC.; see **B. vulgaris** Linn.

B. vulgaris Linn. syn. *B. thunbergii* DC.

Alkaloids from 6 kg. of the plant, oxycanthine (5·1 g.), berbamine-C_6H_6 (1·8 g.), oxyberberine (0·2 g.), isotetrandrine (0·3 g.), jatrorrhizine (0·7 g.), magnoflorine picrate (2·4 g.), and a new base, small amount (*Yakugakuzasshi*, 1960, **80**, 845).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BERGENIA (*Saxifragaceae*)

B. ligulata (Wall.) Engl. syn. *Saxifraga ligulata* Wall.
In indigenous system of medicine it is of high repute for dissolving stones in the kidney.
Isolation of bergenin from the root powder (*J. Indian chem. Soc.*, 1962, **39**, 559).

BIXA (*Bixaceae*)

B. orellana Linn.
Ext. of the plant is used in pharmaceutical preparation. Fractions tested are spasmogenic, antispasmodic (*US Pat.* 3,066,074, 1962; *Chem. Abstr.* 1963, **58**, 4384 *d*).

BLEPHARIS (*Acanthaceae*)

B. edulis Pers.
Constitution of the glucoside 'blepherin' obtained from the seeds, first dihydrofurano-dihydroisocoumarin to be detected as occurring in nature (*J. Indian chem. Soc.*, 1958, **35**, 621).

BLIGHIA (*Sapindaceae*)

•**B. sapida** Kon. syn. *Sapindus obovatus* W. & A.
Unripe fruits yield hypoglycine A, which exerts an effect on blood-sugar level [*Helv. chim. acta*, 1958, **41**(2), 588; *Biol. Abstr.*, 1959, 7394].
Cultivated in India; introduced from Guinea.

BORASSUS (*Palmae*)

B. flabellifer Linn. syn. *B. flabelliformis* Murr.
English–*Palmyra palm.*
Constitution of the galactomannan from the kernels of the nut (*Canad. J. Chem.*, 1961, 1408).

BOSWELLIA (*Burseraceae*)

B. serrata Roxb.
Phytosterol: β-sitosterol (*Curr. Sci.*, 1963, 324). Essen. oil of its exudations —chemical examination (*Perfum. essent. Oil Rec.*, 1963, **54**, 740).

BRAGANTIA (*Aristolochiaceae*)

B. wallichii R. Br.
Alk. chakranine from the roots (*Indian J. med. Res.*, 1958, **46**, 418).

BRASSICA (*Cruciferae*)

•**B. alba** H.f. & T. syn. *B. alba* Hook f. & Th.; *Sinapis alba* Linn.
Volatile oil yield in *B. alba* (white) is increased by mixing *B. nigra* (black) and/or *B. juncea* (brown), mixed Indian mustard seeds (*Sci. & Cult.*, 1958, **24**, 182). Free amino acids in water-sol. exts.; Ninhydrine, and unknown compd. specific for the plant [*Arch. Bioquim. Quim. Farm.*, 1961, **9**(1), 43; *Biol. Abstr.*, 1962, 7833].
Grown in India as a garden crop; a weed arising from cultivation in Punjab.

B. oleracea Linn.
English–*Wild cabbage.*
Isolation of bound ascorbic acid (ascorbigen) (*J. Indian chem. Soc.*, 1961, 939).

BREYNIA (*Euphorbiaceae*)

B. rhamnoides Muell.-Arg.
Roots yield β-sitosterol (*Indian J. Chem.*, 1964, **2**, 83).

BRUCEA (*Simarubaceae*)

B. amarissima (Lour.) Merr. syn. *B. sumatrana* Roxb.
Seeds used in amoebic dysentery (*J. pharm. Soc. Japan*, 1943, **63**, 579; *Chem. Abstr.*, 1951, 1731 *a*).

BUCHANANIA (*Anacardiaceae*)

B. lanzan Spreng. syn. *B. latifolia* Roxb.
English–*Cuddapah almonds.*
Amino acid composition (*Food Sci.*, 1959, 119).

BUTEA (*Leguminosae*)

B. monosperma (Lam.) Kuntze syn. *B. frondosa* Koen. ex. Roxb.
Seeds contain three alks., toxic to earthworms (*Indian J. Pharm.*, 1962, 63). The ether ext. very active, may be a phenolic compd. containing nitrogen (*Curr. Sci.*, 1963, **32**, 456).
Gum, isolation of leucocyanidin (*J. sci. industr. Res.*, 1958, **17B**, 168).

BUXUS (*Buxaceae*)

B. wallichiana Baill.
Leaves give 10 alks., data for buxamine, norbuxamine and buxaminol (*Helv. chim. acta*, 1964, **47**, 968; *Chem. Abstr.*, 1964, **61**, 5710 *e*).

CACCINIA (*Boraginaceae*)

C. glauca Savi
Phytochemical studies: no alks., no steroids (*Indian J. Pharm.*, 1963, **25**, 271). Leaves yield rutin and a triterpenoid acid saponin (*Indian J. Chem.*, 1964, **2**, 130).

CAESALPINIA (*Leguminosae*)

C. crista Linn. syn. *C. bonducella* Fleming

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Seed oil, fractionated by formation of urea adducts of fatty acids, gives the composition of the latter as palmitic, stearic, lignoceric, oleic and linoleic acids (*Indian J. appl. Chem.*, 1960, **23**, 221). Chemical analysis and utilization in India and Jamaica (*Acta phytother.*, 1960, **7**, 61; *Biol. Abstr.*, 1960, 71894). Yields a white amorphous bitter substance, 0·035% (*Pakist. J. sci. industr. Res.*, 1961, **4**, 104).

C. digyna Rottl.

Roots give vakerin, crystalline compd. in 3% yield (*J. sci. industr. Res.*, 1954, **13B**, 147).

C. sappan Linn.

Potential therapeutic value in rheumatic conditions (*Acta phytother.*, 1960, **7**, 115; *Biol. Abstr.*, 1960, 71894).

CAJANUS (*Leguminosae*)

C. cajan (Linn.) Millsp. syn. *C. indicus* Spreng.

Ext. of active urease [*Ann. Biochem.*, 1956, **16**(2), 89; *Biol. Abstr.*, 1957, 25856].

Peptization of red gram proteins and their characterization by electrophoresis [*J. sci. industr. Res.*, 1960, **19B**, 190].

CALENDULA (*Compositae*)

C. officinalis Linn.

English-*Marigold*.

Saponin, the chief active constituent of the plant (*Pharmazie*, 1951, **6**, 547; *Chem. Abstr.*, 1952, 4732 *i*). Exts. of flowers, antimicrobial (*Farm. Zh.*, 1963, **18**, 56; *Chem. Abstr.*, 1964, **60**, 3945 *h*).

Conjugated fatty acids of seed oil [*Canad. J. Chem.*, 1960, **38**(12), 2500; *Biol. Abstr.*, 1961, 2165].

Cultivation of marigold (*Planta Med.*, 1954, **2**, 4; *Chem. Abstr.*, 1956, 5985 *a*).

CALLIGONUM (*Polygonaceae*)

C. polygonoides Linn.

Flower buds effective in treating sunstroke. Flowers and flower buds used in salads [*Sci. & Cult.*, 1961, **22**(1), 40].

CALLISTEMON (*Myrtaceae*)

***C. lanceolatus** Sweet

Essen. oil in the leaves; yield 0·2% [*Saugar Univ. J.*, 1958, **7**, II Sect. A, No. 7, 49].

Indigenous to Australia. Grown near Saugar, M.P.

CALOPHYLLUM (*Guttiferae*)

C. inophyllum Linn.

The seedcoat hard testa contains (±) leucocyanidin (*Curr. Sci.*, 1964, 336).

CALOTROPIS (*Asclepiadaceae*)

C. procera (Ait.) R. Br.

The latex contains five cardiac steroid glucosides with the same aglycone, calotropagenin for which a new structure is postulated (*Chem. & Ind.*, 1956, 487).

CAMELLIA (*Theaceae*; *Ternstroemiaceae*)

C. sinensis (Linn.) Kuntze syn. *Thea sinensis* Linn.

Infusion of tea, a source of fluorine for human body [*Qualitas Pl. Mater. veg.*, 1962, **9**(1), 33; *Biol. Abstr.*, 1962, 12233]. Shikimic acid in the leaves [*Dokl. Akad. Nauk. SSSR*, 1960, **132**(3), 704; *Biol. Abstr.*, 1961, 32272].

CANARIUM (*Burseraceae*)

***C. euphyllum** Kurz

Resin yields volatile oil, 2·3%, v/w; antiseptic against bacteria and fungi and a perfume for soaps and cosmetics (*Bull. reg. Res. Lab. Jammu.*, 1963, **1**, 190).

Andaman Islands.

CANNABIS (*Cannabinaceae*)

C. sativa Linn.

Isolation of a sedative and antibacterial principle distinct from known constituents of hemp (*Z. Naturf.*, 1959, **14b**, 98; *Chem. Abstr.*, 1959, 14413 *c*).

Stem tips and leaves of plants cultivated in Europe yield phenolic acid fractions. The latter contains two acids, one of which possesses antibiotic properties and is related to cannabidiol (*Pharmazie*, 1959, **14**, 349; *Chem. Abstr.*, 1960, 13543 *h*).

Tetrahydrocannabinol and 8 other phenolic components, chromatographic sepn. (*J. Amer. pharm. Ass. Sci. Ed.*, 1960, **49**, 756; *Chem. Abstr.*, 1961, 6785 *a*). Spectrophotometric study of 'charas' (*Bull. natl. hyg. Lab. Tokyo*, 1958, **76**, 113, 115; *Biol. Abstr.*, 1961, 8693, 8694). Volatile phenol fraction consists of eugenol and some guaiacol (*Bull. agric. chem. Soc. Japan*, 1960, 667; *Biol. Abstr.*, 1961, 38603). Isolation and identn. of piperidine and other amino acids (*ibid.* 670). Structure of cannabidiol (*Tetrahedron*, 1963, **19**, 2073; *Chem. Abstr.*, 1964, 6876 *d*).

A high content of very active and antibacterial and analgesic substance found in *C. sativa* var. *indica* and in *C. sativa*. Bactericidal effects observed on Gram-positive microorganisms, in some cases up to a dilution of 1 : 150,000. Utilization of this substance from cannabis in veterinary medicine, e.g. for

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

anthropozoonoses, is suggested. Method of extn. (*Bull. Narcot.*, 1960, **XII**, 3, 5).

Origin—determination of cannabis by gas and paper chromatography (*Analyt. Chem.*, 1963, **35**, 751; *Analyt. Abstr.*, 1964, **11**, 1887). Examination of resin (*Experientia*, 1963, **19**, 267; *Analyt. Abstr.*, 1964, **11**, 2785).

CAPPARIS (*Capparidaceae*)

***C. moonii** Wight
S.–*Rudanti*.

Powdered fruit is used locally for the treatment of puerperal sepsis and septic wounds, and is a potent antitubercular agent. Isolation of *l*-stachydrine, rutin and β-sitosterol (*J. sci. industr. Res.*, 1960, **19B**, 409). The drug has a low tuberculostatic activity *in vitro* (*J. sci. industr. Res.*, 1964, **23B**, 53).

Indigenous to New Zealand; also found in Konkan and in Ceylon.

CAPSELLA (*Cruciferae*)

C. bursa-pastoris Medic.

Dried plants yield saponin (*An. Acad. Farm. Madr.*, 1955, **21**, 49; *Chem. Abstr.*, 1955, 13599 *g*). Extn. and sepn. of fluorescent alks. of the plant under ultraviolet light (*Chem. Abstr.*, 1960, 11375 *e*).

Sepn. of 4 fluorescent alks. (*Acad. Rep. Populare Romine, Studii Cercetari Biochim.*, 1959, 403; *Chem. Abstr.*, 1961, 73544).

CAPSICUM (*Solanaceae*)

C. annum Linn.

Pungent principles of red pepper (*Agric. biol. Chem. Tokyo*, 1962, **26**(4), A24; *Biol. Abstr.*, 1962, **39**, 24730). Physiological and genetical studies on the pungency of capsicum (*Jap. J. Genet.*, 1962, 86; *Chem. Abstr.*, 1962, **60**, 3473). Capsaicin contents of capsicum and its preparations (*Analyst*, 1964, **89**, 377).

CARDUUS (*Compositae*)

C. gigas Ucria and **C. nutans** Linn.

Linoleic acid rich oils; screening of seed oils for their therapeutic value in preventing atherosclerosis (*Indian J. Pharm.*, 1964, **26**, 80).

CAREYA (*Lecythidaceae*)

C. arborea Roxb.

Sapogenins of (*Arch. Pharm. Berl.* 1957, **290**, 578; *Chem. Abstr.*, 1958, 3262 *f*).

CARICA (*Caricaceae*)

C. papaya Linn.

Blood anticoagulant factor of the latex, its purification and general properties. It inhibits clotting, the action of thrombin on fibrinogen (*Proc. Indian Acad. Sci.*, 1955, **42B**, 316; 1956, **43B**, 46). Pharmacological properties of the blood anticoagulant from the plant (*J. sci. industr. Res.*, 1961, **20C**, 213).

Carpaine, an alk. from the leaves (*Econ. Bot.*, 1956, **10**, 258).

CARTHAMUS (*Compositae*)

C. tinctorius Linn.

Luteolin 7-glucoside (0·7% yield), (*Yakugakuzasshi*, 1960, **80**, 1473; *Chem. Abstr.*, 1961, 5871).

Colouring matter of flowers (*Curr. Sci.*, 1960, 54). Components of the flowers, 3-rhamnoglucoside of kaempferol (*J. sci. industr. Res.*, 1962, **21B**, 80).

CARUM (*Umbelliferae*)

C. carvi Linn.

Essen. oil from caraway seed cultivated in Poland, 5·80-10·33% (*Acta polon. pharm.*, 1958, **15**, 371). Composition of the fruit: total ash 6·07-7·49%, essen. oil 4·10-5·85%, fatty oil 9·95-22·14% and nitrogen-containing material 18·94-21·13%, carvone content in the essen. oil 56-58·9% (*Farmacia, Buc.*, 1960, **8**, 429; *Chem. Abstr.*, 1961, 4889 *f*).

C. roxburghianum Benth. ex Kurz.; see **Trachyspermum roxburghianum** (DC.) Craib.

CASSIA (*Leguminosae*)

C. absus Linn.

Chaksine, the alk. from seeds, in small doses depresses medullary centres; in larger doses depresses other regions of brain; has depressant action on intestinal and other involuntary muscles; no effect on striped muscle (*Pakist. J. sci. industr. Res.*, 1949, **1**, 91). Antibacterial properties of the alk. (*Indian J. med. Res.*, 1953, **41**, 459).

β-Sitosterol identn. in chaksu oil (*J. Indian chem. Soc.*, 1958, 210).

C. angustifolia Vahl

Isolation of a new glycoside, which is 1·5 times as active as sennosides A and B (*J. Pharmacol.*, 1958, **10**, Suppl. 186 T-92 T). Determination of the active principles of senna (*Pharm. Zentralh.*, 1959, **98**, 485; *Chem. Abstr.*, 1963, **59**, 2591 *f*). Besides, the pods contain two new glycosides of rhein and chrysophanic acid, and presence of aloe-emodin

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

oremodin glucoside suggested (*J. pharm. Sci.*, 1964, **53**, 110; *Indian J. Pharm.*, 1964, **26**, 243).

C. fistula Linn.

Chemistry of the pulp; extn. of resin, essen. oil, etc. (*Indian J. Pharm.*, 1952, **14**, 61). Antibacterial activity of pulp and seed exts. (*Indian J. Pharm.*, 1956, **18**, 107). 'Fistucacidin', a component of stem-bark (*Curr. Sci.*, 1964, 175). Sennosides A and B from leaves (*Curr. Sci.*, 1964, 462).

C. occidentalis Linn.

Isolation of physcion-(3-methyl-6-methoxy-1,8-dihydroxyanthraquinone (*J. Amer. pharm. Ass.*, 1957, **46**, 271).

C. siamea Lam.

Seeds of this species of the genus alone contain γ-sitosterol, others contain β-sitosterol [*Bull. Calcutta Sch trop. Med. Hyg.*, 1953, **3**(4), 163].

C. tora Linn.

Constituents of dried leaves—a flavanol glucoside (*J. pharm. Soc. Japan*, 1950, **70**, 56; *Chem. Abstr.*, 1951, 3999 *a*). Leaves contain chlorophyll—yield 58 g Cu—chlorophyll from 1 kg. leaves of 100% tinctorial value (*Bull. reg. Res. Lab., Jammu*, 1962, **1**, 57). The gum suspending agent for calomel, kaolin and lactone (*Indian J. Pharm.*, 1964, **26**, 175).

Contains oxytocic principle in the seeds (*Curr. Sci.*, 1962, **31**, 2856). Seeds—three crystalline components isolated (*Indian J. Pharm.*, 1957, 3).

CASUARINA (*Casuarinaceae*)

C. equisetifolia Linn.

Bark contains α-gallocatechol, shown to be as α-gallocatechol and α-pyrocatechol (*Nature, Lond.*, 1957, **179**, 158).

CATHA (*Celastraceae*)

C. edulis Forsk.

Leaves composition: ash, rubber-like substances, glucoside (mannitol), essen. oil (traces) and ascorbic acid, besides three alks. revealed by paper chromatography (*Bull. Narcot.*, 1958, **10**, 2, 30). Isolation from leaves and young shoots of alk. D-nor-isoephedrine and 17 amino acids (*Arch. Pharm. Berl.*, 1960, **293**, 991; *Chem. Abstr.*, 1961, 6782 *i*).

The plant listed as poisonous but is used for its stimulating properties. It causes cardiac and respiratory acceleration (*Ann. pharm. franc.*, 1957, **15**, 89; *Chem. Abstr.*, 1957, 15066 *f*). The stimulating activity due to *d*-nor-pseudoephedrine (0·1% yield); inorganic ions like Mg and phlobaphene-producing tannins present in sufficient amounts cause gastrointestinal effects [*J. mednl. pharm. Chem.*, 1961, **3**, 323; *Chem. Abstr.*, 1961, 14825 *c*; *Naturwissenschaften*, 1963, **50**(9), 354; *Chem. Abstr.*, 1964, **61**, 4973 *h*].

CAUCALIS (*Umbelliferae*)

***C. anthriscus** Scop.

Plant is used locally in medicine; dry fruits contain essen. oil 0·25% (*Soap, Perfum. Cosmet.*, 1964, **37**, 421).

Found in the Himalayas, from Kashmir to Sikkim, alt. 1000-3000 m.

CEDRELA (*Meliaceae*)

C. toona Roxb.

Leucocyanidins of toon wood (*J. sci. industr. Res.*, 1961, **20B**, 615). Structure of cedrelone, a constituent of the heartwood (*J. sci. industr. Res.*, 1962, **21B**, 95).

CEDRUS (*Pinaceae*)

C. deodara (Roxb.) Loud.

English–*Himalayan cedar*.

Non-bitter variety needles, contain 150-250 mg. % of vitamin C (*Chem. Abstr.*, 1955, 7815 *f*). Essen. oil (*Indian J. agric. Sci.*, 1955, **25**, Pt. 1, 73). Estimation of cedrol in cedar-wood oil (*Indian Perfumer*, 1961, **5**, 119).

CENTELLA (*Umbelliferae*)

C. asiatica (Linn.) Urban syn. *Hydrocotyle asiatica* Linn.

The drug has weak sedative but cardio-depressant and hypotensive action (*Indian J. Pharm.*, 1961, 106).

Constituents of the Indian and Ceylonese varieties (*J. Indian chem. Soc.*, 1956, 579, 630, 893). The drug shows the presence of alks., glycosides, sterols, tannins and sugars (*Indian J. Pharm.*, 1961, 106). Isolation of a new triterpene glycoside, thankuniside, and a new triterpene acid, and thankunic acid (*J. sci. industr. Res.*, 1962, **21B**, 239). Anthrone of asiaticoside from the plant (*Ann. pharm. franc.*, 1963, **21**, 561; *Analyt. Abstr.*, 1964, **11**, 3327).

CENTRATHERUM (*Compositae*)

C. anthelminticum (Willd.) Kuntze

Seeds contain oxygenated acid fraction in the oil which is identical with 12,13-epoxy-9-octadecenoic acid (*Curr. Sci.*, 1954, **23**, 293).

CEPHAELIS (*Rubiaceae*)

C. ipecacuanha (Brot.) A. Rich.

Emetine hydrochloride preparations (*J. sci. industr. Res.*, 1951, **10B**, 76). Roots contain a glucoside, ipecoside, in

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

1% yield (*Ann. pharm. franc.*, 1954, **12**, 466; *Chem. Abstr.*, 1955, 4233 *i*).

CERBERA (*Apocynaceae*)

C. manghas Linn. syn. *C. odollam* Gaertn.
The principal glycosides of the poisonous seed kernels identified as cerberin, neriifolin and thevetin (*J. sci. industr. Res.*, 1957, **16B**, 209).

CESTRUM (*Solanaceae*)

***C. diurnum** Linn.
Crystalline saponin [*Bull. Calcutta Sch. trop. Med. Hyg.*, 1961, 9(1), 16].
Cultivated in Western India.

***C. nocturnum** Linn.
English–*Lady of night.*
Essen. oil (*Perfum. essent. Oil Rec.*, 1954, **45**, 80).
Cultivated as an ornamental throughout India.

CHEIRANTHUS (*Cruciferae*)

C. cheiri Linn.
Cheirotoxin, a glycoside, and cheiroside A, a less active glycoside, isolated from the seeds (*Pharmazie*, 1951, **6**, 512).

CHENOPODIUM (*Chenopodiaceae*)

C. ambrosioides Linn.
Essen. oil and ascaridole content (*Pharm. Zentralh.*, 1952, **91**, 43; *Chem. Abstr.*, 1952, 7284 *g*; *J. Taiwan pharm. Ass.*, 1951, **3**, 2; *Chem. Abstr.*, 1954, 4178 *d*; *J. pharm. Soc. Japan*, 1953, **73**, 1383; *Chem. Abstr.*, 1954, 3639 *g*). Soviet chenopodium oil, 60-80% ascaridole (*Aptech. Delo*, 1953, **2**, No. 5, 63; *Chem. Abstr.*, 1953, 2676 *i*). Ascaridole synthesized from α-terpinene, thus its precursor in its biogenesis (*J. Amer. pharm. Ass.*, 1951, **40**, 68). Essen. oil in cultivated wormseed in cooler districts not inferior to those of warmer (*J. pharm. Soc. Japan*, 1953 **73**, 1044; *Chem. Abstr.*, 1954, 1631 *f*). The oil, its constants and ascaridole contents from *C. ambrosioides* var. A and var. B are similar to those from var. *C. anthelminticum* (*Trav. Soc. Pharm. Montpellier*, 1950, **10**, 24; *Chem. Abstr.*, 1954, 6080 *a*). Essen. oil from plants raised in J. & K. State (*Indian J. Pharm.*, 1957, 290). Structure of aritasone, its essen. oil constituents (*Yakugakuzasshi*, 1962, **82**, 1278; *Chem. Abstr.*, 1963, 2866 *f*). Spectrophotometric determination of ascaridole (*Riechstoffe Aromen Koerperpflegemittel*, 1964, **14**, 36; *Chem. Abstr.*, 1964, **61**, 530 *c*).

CHLOROXYLON (*Rutaceae*)

C. swietenia DC.
Structure of the gum and aldobiuronic acid and nature of sugars (*J. Indian chem. Soc.*, 1964, **41**, 173).

CHRYSANTHEMUM (*Compositae*)

C. cinerariaefolium Vis. syn. *Pyrethrum cinerarifolium* Trev.
Highest pyrethrin contents in the inflorescence when in full bloom (1·22%) and lowest in the preceding period (0·71%); ether and petroleum ether better solvents than benzene; the biological activity of the crude drug not related to the pyrethrin contents (*Dissnes pharm., Warsz.*, 1959, **11**, 39; *Chem. Abstr.*, 1959, 13510 *a*).

C. coronarium Linn.
Leaves contain the 7-glucosides of quercetin, quercetagetin and luteolin (*Arch. Biochem. Biophys.*, 1960, **90**, 62; *Biol. Abstr.*, 1961, 18535).

C. indicum Linn.
Essen. oil, a new source of chrysanthenone, active on the brain centre affected by Parkinson's disease (*An. Real Soc. Espan. Fis. Quim.*, 1962, **58B**, 339; *Chem. Abstr.*, 1963, 2319 *e*).

CICER (*Leguminosae*)

C. arietinum Linn.
Lower melting fraction from *chana* — 5,7-dihydroxy-4-methoxyisoflavone, and higher melting fraction—7-hydroxy-4'-methoxyflavone (*Pakist. J. sci. industr. Res.*, 1950, **2**, 29). Assay of the oestrogenic activity of the fixed oil (*J. sci. industr. Res.*, 1955, **14B**, 128). Isolation of three new crystalline glycosidic fractions (*J. sci. industr. Res.*, 1958, **17B**, 494).

CICUTA (*Umbelliferae*)

C. virosa Linn.
Toxic principles (*Ann. pharm. franc.*, 1953, **11**, 97; *Chem. Abstr.*, 1954, 2987 *i*).

CINCHONA (*Rubiaceae*)

C. ledgeriana Moens ex Trimen
Assay of cinchona bark, alternative method to B.P. (*Indian J. Pharm.*, 1954, **16**, 128). Distribution of alk. in the plant (*Bull. agric. Congo belge*, 1957, **48**, 1137; *Chem. Abstr.*, 1958, 19019 *f*).

CINNAMOMUM (*Lauraceae*)

C. camphora Nees & Eberm.
Essen. oil (*Indian J. agric. Sci.*, 1955, **25**, 73).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Seed fat contains glycerides of lauric, capric and oleic acids (*J. Indian chem. Soc.*, 1957, **34**, 143).

C. cassia Blume

Essen. oil (oil of Cassia) (*J. Pharmacol.*, 1964, **16**, 347; *Chem. Abstr.*, 1964, 1704 *d*).

***C. cecidodaphne** Meissn.

Ass.–*Gondserai*; Garo.–*Gam-salu*; Manip. & Sylh.–*Gonorai*; Nepal–*Mulagiri*.

Fruit kernel fat—glycerides of lauric acid (78%), oleic acid (18%). The unsaponifiables yield β-sitosterol and pericarp gives an essen. oil of camphor odour (*Indian J. chem. Soc.*, 1964, **2**, 252).

Found in Eastern Himalayas, Sikkim, Bhutan, Assam and Sylhet.

C. zeylanicum Blume

Indian cinnamon leaf oil, cultivated variety of Kerala and wild variety of Mysore (*Perfum. essent. Oil Rec.*, 1963, **54**, 30, 732).

CISSAMPELOS (*Menispermaceae*)

C. pareira Linn.

Indigenous substitute for curare, *d*-tubocurarine and other curariform drugs. Hayatine salts preparations, hayatine methiodide, a muscular relaxant (*Planta Med.*, 1959, **7**, 250; *Chem. Abstr.*, 1960, 7065 *i*). Hayatine, *l*-curine and *d*-isochondrodendrine, all having curare-like activity, isolated from the roots and vines (*J. Amer. pharm. Ass. Sci. Ed.*, 1960, **49**, 727; *Chem. Abstr.*, 1961, 4887 *a*). Isolation of hayatinine from the roots and its structure (*J. sci. industr. Res.*, 1962, **21B**, 428).

Water-sol. alks. of the root-bark: *l*-bebeerine, hayatine, hayatinine, *d*-isochondrodendrine [*Curr. Sci.*, 1963, **32**(3), 114].

CISSUS (*Vitaceae*)

C. quadrangularis Linn.

Contains 3-ketosteroid, a steroidal principle (*Indian J. Pharm.*, 1964, **26**, 247).

Has acetylcholine-like action; analogous to muscarine and nicotine. In atropinized hearts, it showed cardiotonic activity (*Indian J. med. Res.*, 1964, **52**, 63).

CITRULLUS (*Cucurbitaceae*)

C. colocynthis Schrad.

Bitter oil, 'citbittol', isolated from the peel-free flesh of ripe fruit and identified by paper chromatography (*Igaku to Seibutsugaku*, 1959, **51**, 52; *Chem. Abstr.*, 1962, 3563 *d*).

Colocynth, the dried pulp of the fruit, is used in indigenous medicine. The ext. highly effective against *Salmonella paratyphi* and fairly against *S. typhosa*, *Corynebacterium diphtheriae*, *Esch. coli*, *Staph. aureus*, *Bacillus megatherium* and *S. schottmulleri* in descending order (*Indian J. Pharm.*, 1957, 228).

The fruit juice contains α-elatrine, citrulluin, citrullene and citrulluic acid (*J. Indian chem. Soc.*, 1955, **32**, 669). Fresh mesocarp of the fruit and seeds contain glucose and α-pinosterol and crystalline bitters (*J. sci. industr. Res.*, 1962, **21B**, 238). *p*-Hydroxybenzyl methyl ester from the unripe fruit [*Agric. biol. Chem. Tokyo*, 1961, **25**(4), 269; *Biol. Abstr.*, 1961, 62050]. Low boiling constituents of the fruit (*J. chem. Soc.*, 1963, 4991).

C. vulgaris Schrad.

English–*Watermelon*.

Seeds anthelmintic. Fatty oil, aq. and alcoholic exts. of seeds paralyse tapeworm and roundworm in cats (*Farmak. Toks.*, 1954, **17**, No. 5, 50; *Chem. Abstr.*, 1955, 2813 *d*). A new amino acid, α-amino-β-(pyrazolyl-N) propionic acid from the fruit (*Nature, Lond.*, 1959, 60). (−)β-Pyrazol-δ-ylalamine, an amino acid from the seeds (*Biochem. J.*, 1960, 543).

CITRUS (*Rutaceae*)

C. aurantifolia (Christm.) Swingle syn. *C. medica* var. *acida* Hook. f.

English–*Lime*.

Petitgrain oil from lime.

Essen. oil from fresh leaves and twigs, yield 0·19%, contains terpenes 20·5%, alcohols 13·2%, aldehydes 36·0%, esters 23·8%, acids 2·0% and citropten 2·0% (*Indian Perfumer*, 1957, **1**, 25). Ext. of the peel gives 6-glucoside of aureusidine [*C.R. Acad. Sci. Paris*, 1963, **257**(2), 534; *Chem. Abstr.*, 1964, 9731 *g*].

C. aurantium Linn.

English–*Sour, bitter orange*.

Leaves and tender twigs yield an essen. oil known as petitgrain oil.

Citrus oil can be used in confectionery in place of orange oil and lemon oil (*Proc. a. Conv. Oil Technol. Ass. India*, 1949, **5**, 44). Constituents of the essen. oil: 7-hydroxycoumarin geranyl ether (auraptene) [*Pharm. Bull.*, 1953, **1**, 119; *Chem. Abstr.*, 1954, 6080 *g*; *Helv. chim. Acta*, 1963, **46**, 2705; *Chem. Abstr.*, 1964, **60**, 5271 *d*; *Riv. ital. Essenze*, 1964, **46**(5), 228; *Chem. Abstr.*, 1964, **61**, 11844 *b*].

Estimation of pectin and total glycosides in dried peels (*Indian J. Pharm.*,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

1960, 234). Petroleum extn. of peels gave nobilitin and with methyl alcohol extn. hesperidin (*Indian J. Chem.*, 1964, **2**, 462).

Indigenous to India. Cultivation largely centred in Guntur district.

***C. bergamia** Risso et. Poit.

English–*Bergamot orange of Europe.*

Essen. oil, main constituents limonene 50% and linalool 40% (*Farmacognosia*, 1954, **14**, 233; *Chem. Abstr.*, 1955, 15181 *c*). It is used in the preparation of Eau-de-Cologne.

Not grown commercially in India.

***C. hystrix** DC.

English–*Mauritius papeda* or *Porcupine orange.*

Fruits not eaten but used as an insecticide for killing land leeches.

Essen. oil from leaves, yield 6-7%; main constituents *l*-citronellal (*Parfum. cosmet. Savons*, 1958, **1**, No. 2, 51).

Very recently introduced in India, though of insignificant importance. Widely distributed in East Indian Archipelago in wild state.

***C. jambhiri** Lush. syn. *C. limonis* Osb.

English–*Roughlemon* or *jamberi.*

S.–*Jambira*; H.–*Khatta*; B.–*Gandharaj*; Tel.–*Jambira, karukaya.*

Indigenous commercial variety of *C. limon*. The juice of fruit from M.P. yields citric acid 6·44% and ascorbic acid 32·25 mg./100 ml. Worth exploitation commercially (*Indian J Pharm.*, 1951, **13**, 120)

Peel oil (yield 0·75%), and petitgrain oil (yield 0·35%); main constituents *d*- and *dl*-limonene 85·2% and 20·1% respectively. Their physical and chemical data (*Riechstoffe Aromen*, 1963, **13**, 25).

Grown in parts of eastern Punjab near Pathankot.

***C. karna** Rafin = *C. aurantium* var. *khatta* Bon.

H.–*Karna khatta* or *idnimbu*; M.–*Idlemon*; P.–*Mokari, Karna khatta.*

The plant is probably a natural hybrid between sour orange and lemon.

Peel oil (yield 0·35%) and petitgrain oil (yield 0·55%); main constituents, *d*- and *dl*-limonen 81·5% and *d*- and *dl*-limonene 49·4% respectively and geraniol 36·4%. Their physical and chemical data (*Riechstoffe Aromen*, 1963, **13**, 25). Yield of oil from fresh leaves 0·256-0·286% (*Indian Soap J.*, 1958, **24**, 47).

A variety of *C. aurantium* commonly grown in certain parts of India for use as a root-stock.

C. limettioides Tanaka

English–*Sweet lime.*

H.–*Mittha*; B.–*Sarbati lebu*; Tel.–*Nimma*; *Kouri changai*; Tam.–*Elummichchai.*

Essen. oil from fresh leaves, yield 0·18%, main constituents *d*- and *dl*-limonene 26·5%, linalool 16·42%, geraniol 9·44% and linalyl acetate 19·38% (*Indian Soap J.*, 1958, **24**, 47).

C. limon (Linn.) Burm. f. syn. *C. medica* Linn. var. *limonum* Linn., *C. pseudolimon* Tanaka.

English–*Galgal* or *hill lemons.*

Peel of the fruit from Taiwan (Formosa) gives a glycoside, neohesperidine (*J. sci. industr. Res.*, 1959, **18B**, 129).

Peel oil (yield 0·40%) and petitgrain oil (yield 0·40%); main constituents *d*- and *dl*-limonen 84·2% and *d*- and *dl*-limonene 33·5%, citral 33·2% and α-terpineol 29·8% respectively. Their physical and chemical data (*Riechstoffe Aromen*, 1963, **13**, 25). Peels of the Assam citrus yield γ-sitosterol and hesperidin (*Indian J. Chem.*, 1964, **2**, 40).

***C. madurensis** Lour. syn. *C. microcarpa* Bunge and *C. mitis* Blanco.

H.–*Orangequat*; *Chineseorange*, *Orange hazara*; Tel.–*Eda pandu, Kalamandin.*

Essen. oil from fresh peels 0·7% (0·2% on fruit wt.); main constituent *d*-limonene 91·85% (*Indian Perfumer*, 1958, **2**, Pt. 2, 26). An insol. glycoside, hespiridin (2% yield) from the ext. of dry peels (*J. sci. industr. Res.*, 1960, **19B**, 500). Isolation of new flavanones (*J. sci. industr. Res.*, 1961, **20B**, 187). β-Sitosterol D-glucoside isolated from the seed oil, fruit juices and rags of fruits (*J. sci. industr. Res.*, 1962, **21B**, 343).

Cultivated throughout India.

C. maxima (Burm.) Merr.

English–*Pummelo.*

Peel oil (yield 0·8%) (0·5% on fruit wt.) [*Pharm. Weekbl.*, 1958, **93**(1), 15; *Biol. Abstr.*, 1958, 28437].

***C. microcarpa** Bunge; see **C. madurensis** Lour.

***C. mitis** Blanco; see **C. madurensis** Lour.

***C. pseudolimon** Tanaka; see **C. limon** (Linn.) Burm. f.

C. reticulata Blanco

Peel oil (yield 0·50%) and petitgrain oil (yield 0·50%), main constituents, *d*- and *dl*-limonen 78·5% and *d*- and *dl*-limonene 42·5% respectively and linalool 15·4%. Their physical and chemical data (*Riechstoffe Aromen*, 1963, **13**, 25). Seed oil—constants and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

characteristics (*Indian Oil Soap J.*, 1963, 29). The juice contains sugars and free amino acids (*Curr. Sci.*, 1964, 89).

C. sinensis (Linn.) Osbeck

Essen. oil; its constituents and new compds. by using gas-liquid chromatography (*J. Fd Sci.*, 1961, **26**, 401)

CLAVICEPS (*Hypocreales*)

C. purpurea (Fr.) Tul.

Lipogenesis in submerged growth [*Diss. Abstr.*, 1956, **16**(9), 1666; *Biol. Abstr.*, 1957, 15175]. Saprophytic cultivation of *C. purpurea* [*Arch. Pharm. Berl.*, 1956, **289**(61); 378; *Biol. Abstr.*, 1957, 15185]. Alkaloidal formation of rye ergot in saprophytic cultures (*Pharmazie*, 1962, **17**, 411; *Chem. Abstr.*, 1963, **58**, 1306 *b*).

Cultivation of ergots on rye [*Acta Pharm. sin.*, 1959, **7**(1), 31]. The clavin alks. in the metabolism of ergot of rye (*Sci. pharm.*, 1960, 123; *Biol. Abstr.*, 1961, 42577).

CLERODENDRUM (*Verbenaceae*)

***C. fragrans** Vent.

H.–*Madanmohan*.

Leaves with black pepper used in colic pain.

Indigenous to China, Sumatra and Java; cultivated in Indian gardens.

C. indicum (Linn.) Ktze.

Bark contains hexitol (D-mannitol) 78%, along with sorbitol (*Indian J. Pharm.*, 1961, 77).

C. infortunatum Linn.

Active principle, clerodin (*J. Indian chem. Soc.*, 1951, **28**, 295).

Roots with hot petroleum and benzene yield lupeol and β-sitosterol successively (*Indian J. Chem.*, 1964, **2**, 172).

C. phlomidis Linn. f.

Chemical examination (*J. sci. industr. Res.*, 1962, **21B**, 48).

C. serratum (Linn.) Moon

Assam–*Nangal-bhanga*; H. & B.–*Bhurangi*.

The roots and the leaves are used in febrile and catarrhal affections. Young shoots, leaves and flowers are eaten as vegetable.

It is one of the few drugs that block histamine response. Contains a highly active fraction, app. 100 times more potent than the crude drug (*Indian J. Pharm.*, 1964, **26**, 105).

Found east of Sutlej; very common in Assam and Bengal up to 1000 m. alt.

CLITORIA (*Leguminosae*)

***C. mariana** Linn.

Leaves yield β- and γ-sitosterols (*Curr. Sci.*, 1960, 225). Isolation of δ-lactone compd. (*Nature, Lond.*, 1960, 149).

Khasia Hills, alt. 1550-1850 m.

C. ternatea Linn.

The leaves yield a δ-lactone, aparajitin (*J. Indian chem. Soc.*, 1959, 243); the blue and white varieties contain an ester and a resin glycoside (*Indian J. Pharm.*, 1959, 166). Seeds gave the tests of nucleoprotein, which show the presence of leucine, isoleucine, valine, alanine, glycine, arginine, glutamic acid, aspartic acid and tyrosine on hydrolysis [*Res. J. Hindi Sci. Acad.*, 1959, **2**(1), 1].

COCCINIA (*Cucurbitaceae*)

C. indica W. & A.

A household remedy in Bengal for diabetes. Roots show the presence of lupeol acetate and β-amyrin acetate, and β-sitosterol (*J. Indian chem. Soc.*, 1958, 905). Young fruits of the bitter variety, lupeol and β-amyrin as also cucurbitacin B glycoside (*J. sci. industr. Res.*, 1962, **21B**, 237).

Hypoglycemic principles in ethanolic and aq. exts. Orally active and comparable with tolbutamide (*J. Pharm., Lond.*, 1963, **15**, 411), cause inhibition of hypoglycemic response of anterior pituitary exts. in rats (*Indian J. med. Res.*, 1964, **52**, 200).

COCCULUS (*Menispermaceae*)

C. hirsutus (Linn.) Diels

Chemical investigation of the plant and root (*Curr. Sci.*, 1956, **28**, 324; *J. sci. industr. Res.*, 1962, **21B**, 411). Roots show the presence of D-trilobene and DL-coclaurine (*J. sci. industr. Res.*, 1961, **20B**, 125). Stems and roots contain alks., glycosides and sterols. Water-sol. fraction of the ext.—sedative, hypotensive, bradycardiac, cardiotonic and spasmolytic (*Indian J. med. Res.*, 1964, **52**, 300 *b*).

C. laurifolius DC.

Roots contain a non-phenolic alk. (*J. pharm. Soc. Japan*, 1956, **76**, 1048; *Chem. Abstr.*, 1957, 1542 *i*); isolation of magnoflorine (*Pharm. Bull. Tokyo*, 1956, **4**, 407; *Chem. Abstr.*, 1957, 10004 *f*).

Alks. in leaves, yield 0·2%; have curarizing action and decrease blood pressure on test animals [*Farmacognosia*, 1955, **15**(38), 397; *Biol. Abstr.*, 1957, 22417).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

COCHLEARIA (*Cruciferae*)

C. armoracia Linn.
English–*Horse-radish.*
The plant produces inhibitory effects on Gram-negative germs of the typhoid-paratyphoid-enteritis group [*J. Hyg. Epidem. Microbiol. Immun.*, 1957 **1**(2), 213; *Biol. Abstr.*, 1959, 7395].

COCOS (*Palmae*)

C. nucifera Linn.
A mannan from the kernel of coconut (*J. Indian chem. Soc.*, 1962, 687). Water-sol. galactomannan (*Canad. J. Chem.*, 1961, 373).

COLCHICUM (*Liliaceae*)

C. luteum Baker
Colchicine in the corms 0·21-0·25% and in the seeds 0·41-0·43%. Boiling the corms in water as also drying them at 65°F. and above, lowers colchicine contents (*Pakist. J. For.*, 1960, **10**, 314).

***C. speciosum** Stev.
H.–*Shurinjan Shirin.*
A new alk., speciosine (Soviet Research in Pharm. Chemistry 1956, pt. III; *Pharmacognosy*, **11**, 589, Consultants Bureau Inc., New York; *Biol. Abstr.*, 1960, **35**, 42761).
Caucasian region, Persia and Asia Minor.

COLEUS (*Labiatae*)

C. amboinicus Lour. syn. *C. aromaticus* Benth.
Essen. oil, yield 0·05-0·12%; contains 65·2% of the phenolic constituents, viz. et. salicylate, thymol, carvacrol, eugenol and chavicol (*Indian Oil Soap J.*, 1959, **25**, 120).

C. blumei Benth.
Sedoheptulosan formed in the syrup made from leaves (*Contr. Boyce Thompson Inst.*, 1961, 35; *Biol. Abstr.*, 1961, 51701).

COMMIPHORA (*Burseraceae*)

C. mukul (Hook. ex Stocks) Engl.
Essen. oil from resins contains myrcene, dimyrcene and polymyrcene (*J. Indian chem. Soc.*, 1950, **27**, 436). Sugars in the gum and aldobiouronic acid structure (*Indian J. Chem.*, 1964, **2**, 57, 156).

CONIUM (*Umbelliferae*)

C. maculatum Linn.
English–*Hemlock.*
Fruit oil, fatty acids (*J. pharm. Soc. Japan*, 1952, **72**, 476; *Chem. Abstr.*, 1952, 8812 *f*).
Alk. α-coniceine in leaves and young tissues, also in fruits. The fruits also contain coniine and N-methylconiine (*Biochem. J.*, 1956, 259; 1959, 556; *Planta Med.*, 1963, **11**, 92; *Chem. Abstr.*, 1964, **60**, 5276 *b*).

CONVALLARIA (*Liliaceae*)

***C. majalis** Linn.
English–*Lilly of the valley.*
Plant—heart poison; active constituents, cardiac glucosides, convallotoxin, convallatoxol, convallamarin, saponin convallarin, etc. (*Acta pharm. int.*, 1960, **1**, 71; *Chem. Abstr.*, 1951, 10506 *h*; *Chem. Abstr.*, 1958, 8541 *a*; *Chem. Ber.*, 1954, **87**, 1108; *Pharm. Zentralh.*, 1957, **96**, 452; *Chem. Zvesti.*, 1958, **12**, 606, 679; *Chem. Abstr.*, 1958, 8541 *a*).
World temp. region. Cultivated in India as winter flowering herb.

CONVOLVULUS (*Convolvulaceae*)

***C. pluricaulis** Choisy
Punjab–*Porprang, Dodak.*
The plant contains alk., sankhpuspine (*Chem. Abstr.*, 1948, 4777). Gives two crystalline substances, Sterol I and Sterol II (*Indian J. Pharm.*, 1958, **20**, 239).
Occurs in the plains of Northern India and Bihar.

CORCHORUS (*Tiliaceae*)

C. capsularis Linn.
Seeds contain two digitalis glycosides, corchoroside A and corchoroside B (*C.R. Acad. Sci., Paris*, 1954, **238**, 507; *Chem. Abstr.*, 1954, 6652 *h*). A bitter principle, corchorin (*Curr. Sci.*, 1954, **23**, 332).

C. olitorius Linn.
Seeds contain two digitalis glycosides, corchoroside A and corchoroside B (*C.R. Acad. Sci., Paris*, 1954, **238**, 507; *Chem. Abstr.*, 1954, 6652 *h*).

CORIANDRUM (*Umbelliferae*)

C. sativum Linn.
Essen. oil determination (*Pharm. Weekbl.*, 1950, **85**, 7328; *Chem. Abstr.*, 1951, 3999 *h*). Chemical investigation (*Indian J. Pharm.*, 1959, 324). *C. sativum* fruit in Rumania has 0·65-0·76% oil with 73·1-75·7% total alcohols (*Farmacia, Buc.*, 1960, **8**, 383; *Chem. Abstr.*, 1961, 3003 *b*). Seeds on prolonged storage even at −14°C., lose 0·18-1·5% (abs.) of their essen. oil; seeds in glass containers remain fresh [*Spirt. Prom.*, 1961, **27**(5), 13; *Chem. Abstr.*, 1961, 26375 *e*).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Fatty oil from fruits [*C.R. Acad. bulg. Sci.*, 1957, **10**(2), 133; *Chem. Abstr.*, 1958, 3267 *h*].

CORYDALIS (*Fumariaceae*)

C. govaniana Wall.

Alks., protoine, choline, corlumine, biculline and isocorydine—their extn. (*Canad. J. Pharm.*, 1961, **39**, 1801; *Chem. Abstr.*, 1962, 1491 *a*).

CRATAEGUS (*Rosaceae*)

C. oxyacantha Linn.

Active principle, ' crataegus lactone ', responsible for coronary vasodilation (*Pharmazie*, 1951, **6**, 141; *Chem. Abstr.*, 1951, 8207 *d*). This new therapeutically active compd. causes protracted coronary dilation with increase of contraction amplitude in heart of guinea-pigs (*Arzneimittel-Forsch.*, 1960, **10**, 825; *Chem. Abstr.*, 1961, 5873 *a*). Cardioactive substances (*German Patent* 590258, 1953).

Leaves contain higher flavonoid content than the fruits (*Pharm. Acta Helvet.*, 1961, **36**, 30; *Chem. Abstr.*, 1961, 15832 *b*).

CRATAEVA (*Capparidaceae*)

C. nurvala Buch.-Ham.

Root-bark yields lupeol, β-sitosterol and varunol (*J. sci. industr. Res.*, 1951, **10B**, 195). The powdered bark gives a triterpene product identical with lupeol (*Bull. Calcutta Sch. trop. Med. Hyg.*, 1959, **7**, 105).

CRINUM (*Amaryllidaceae*)

C. asiaticum Linn.

Seeds contain lycorine and crinamine alks. (*J. pharm. Soc. Japan*, 1944, **64**, 239; *Chem. Abstr.*, 1951, 821 *b*).

C. defixum Ker-Gawl.

Lycorine, pharmacologically weak alk., its isolation (*Curr. Sci.*, 1954, **23**, 265; *Indian J. Pharm.*, 1955, **17**, 40, 67).

C. latifolium Linn.

Lycorine, a physiologically active constituent, and its isolation from bulbs and seeds (*Indian J. Pharm.*, 1955, **17**, 76; *Curr. Sci.*, 1955, **24**, 25; *Indian J. Pharm.*, 1955, **17**, 229).

***C. powellii** Hort. var. *album* Hort.

English–*White Crinum*.

Contains crinidine, lycorine, powelline, hemanthamine, caranine, criwelline and crinalbine, a new alk. (*Naturwissenschaften*, 1960, **47**, 498; *Chem. Abstr.*, 1961, 8760 *c*).

CROCUS (*Iridaceae*)

C. sativus Linn.

Riboflavin and thiamine contents (*Nature, Lond.*, 1953, **172**, 544).

CROTALARIA (*Leguminosae*)

***C. anagyroides** H. B. & K.

Seeds contain L-methylene pyrolizidine and senecionine (*Indian J. Pharm.*, 1964, **26**, 80).

Native of Venezuela; introduced as shade shrub in tea and coffee plantations.

C. juncea Linn.

Seed ext. gave ' corchorin ', its bitter principle (*Curr. Sci.*, 1954, **25**, 332).

C. medicaginea Lam.

The unsaponifiables from seed-fat contain: pentatriacontane, triacontanol and β-sitosterol; the saponifiable fraction gives myristic, behenic and oleic acids (*Indian J. Pharm.*, 1958, **20**, 361).

Screening—linoleic acid rich oils for their therapeutic value in preventing atherosclerosis (*Indian J. Pharm.*, 1964, **26**, 80).

C. mucronata Desv. syn. *C. striata* DC.

Alk. mucronaline from the seeds [*Yao Hsueh Hsueh Pao*, 1964, **11**(4), 246; *Chem. Abstr.*, 1964, 8129*c*].

C. spectabilis Roth

Steroidal saponins absent in roots, leaves and flowering tops. Toxic alk. monocrotaline isolated from all parts (*Econ. Bot.*, 1956, **10**, 254).

CROTON (*Euphorbiaceae*)

C. joufra Roxb.

Fruit kernel oil, yield 37·1%; its physico-chemical characters (*Indian Oil Soap J.*, 1960, **26**, 137; 1963, **29**, 138).

***C. sparsiflorus** Morong

Colouring matters (*J. Indian chem. Soc.*, 1962, 545).

Introduced in India from South America. Widely distributed throughout India.

C. tiglium Linn.

Seeds—extn. of toxic substances. Peeled fruits also contain two poisons (*Chron. nat.*, 1950, **106**, 466). Croton oil contains a vesicant non-purgative and a non-vesicant purgative fraction (*Bull. Galenica*, 1953, **16**, 37; *Chem. Abstr.*, 1955, 7191 *e*).

Seeds contain two tumour-promoting principles [*Arch. int. Pharmacodyn.*, 1958, **115**(4), 408; *Biol. Abstr.*, 1959, 11437].

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

R
633·8803
C455:2

CUCURBITA (*Cucurbitaceae*)

C. maxima Duch.

Seeds yield resin having vermicidal properties, but not glucosides (*An. Fac. Farm. Bioquim. Univ. S. Marcos*, 1954, **5**, 86; *Chem. Abstr.*, 1957, 3092).

C. pepo Linn.

English–*Hungarian pumpkins.*

Mannitol preparations (*Magyar Kem. Lapja*, 1949, **4**, 537; *Chem. Abstr.*, 1951, 1303 *f*). Analysis of fruit-pulp for its nutritive value to supplement 'South Indian Diet' (*Indian J. Pharm.*, 1955, 133).

121538

CUMINUM (*Umbelliferae*)

C. cyminum Linn.

Essen. oil in seeds 2·5%; contains terpenes as *p*-cymene and di-pentene, aldehydes as cuminaldehyde and cuminyl alcohol [*J. Proc. Oil Tech. Ass., India*, 1958, **12**(11), 111].

CUPRESSUS (*Cupressaceae*)

C. sempervirens Linn.

Essen. oil, from Spanish plant (yield 1·66%) (*Indian Perfumer*, 1951, **6**, 60; *Chem. Abstr.*, 1951, 6349 *h*). From fruits (yield 0·5%) (*Perfum. essent. Oil Rec.*, 1959, **50**, 823).

CURCUMA (*Zingiberaceae*)

C. amada Roxb.

Rhizomes on acetone ext. yield a colourless oil, curcumin and a phyto-testerol and an azulenogenic oil having pinene, camphor, *l*-β- and *l*-α-curcumene and ar-turmerone (*Indian J. Chem.*, 1964, **2**, 39).

C. longa Linn.

Curcuminoids — chromatographic study (*J. Pharmacol.*, 1953, **5**, 448). The essen. oil and the pigment curcumin—cholagog and choleretic acid antibacterial (*J. sci. industr. Res.*, 1956, **15C**, 262).

CUSCUTA (*Convolvulaceae*)

C. reflexa Roxb.

Parasitic medicinal plant; when on host plant *Santalum album*, yields D-mannitol and when on other hosts, yields dulcitol (*Indian J. Chem.*, 1964, **2**, 81). On host plant *Glycosmis trifolia*, yields leutolin and on other hosts, it yields kaempferol (*Indian J. Chem.*, 1964, **2**, 378).

CYATHOCLINE (*Compositae*)

***C. lyrata** Cass.

Dehra Dun–*Gandani.*

Essen. oil contains cythocol, a sesquiterpene in the phenolic portion (*Perfum. essent. Oil Rec.*, 1961, **52**, 558).

Sub-Himalayan tract up to 1000 m., from Kashmir to Nepal.

CYCAS (*Cycadaceae*)

C. revoluta Thunb.

Some new azoxyglycosides [*Bull. agric. chem. Soc. Japan*, 1960, 536; *Agric. biol. Chem., Tokyo*, 1961, **25**(12), 937; *Biol. Abstr.*, 1962, 23606].

CYCLEA (*Menispermaceae*)

***C. burmanii** Miers syn. *C. peltata* H. f. & T.

H.–*Parvel*; G.–*Kelipar*; Tam.–*Para*; Konkan–*Paral*; *Parawal.*

Roots are used in indigenous system for a variety of ailments: jaundice, stomachache, fever, leprosy and asthma; contain two alks. and D-quercitol. The principal base identical with tetrandrine (*J. sci. industr. Res.*, 1958, **17B**, 163). Alks. from roots, *d*-tetrandrine, *dl*-tetrandrine, isochondrodendrine (*J. pharm. Sci.*, 1961, **50**, 164). Three more alks., burmannaine, base C and base D (*Indian J. Chem.*, 1964, **2**, 296).

From Konkan down to Ceylon and from Assam and Khasia Hills eastwards.

CYDONIA (*Rosaceae*)

C. oblonga Mill.

Leaves contain tannins (11%) and flavones (rutin). Their chemical and pharmacodynamic studies (*Anais Fac. Farm. Porto*, 1957, **17**, 5; *Chem. Abstr.*, 1958, 11361 *g*).

Seeds contain glycosides, mucilaginous substances, pectins, lipids, resins and vitamin C; no alks., saponins or tannins. Mucilaginous ext. is used in respiratory diseases as expectorant in children in Azerbaidzhan (*Chem. Abstr.*, 1962, 6090 *f*).

CYMBOPOGON (*Gramineae*)

C. citratus (DC.) Stapf

Lemongrass production, cultivation, harvesting, distillation and composition of the oil (*Indian Soap J.*, 1951, **17**, 68). Lemongrass oil from Travancore-Cochin contains citral (70-80%) (*Bull. Res. Inst. Univ. Travancore*, 1954, **A3**, 165); that from Ceylon contains citral (75·8-82·5%) [*Mfg Chem.*, 1959, **30**(10), 415; *Chem. Abstr.*, 1964, **60** 363 *d*]. Essen. oil from Ghana-grown plants—citral contents 70-78% (*W. Afr. Pharm.*, 1964, **6**, 75; *Chem. Abstr.*, 1964, **60**, 14460 *h*).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

An alk. from the rhizomes—not hordenine nor gramine the known bases. Ultraviolet spectrum suggests indole nucleus [*Garcia Orto*, 1962, **10**(1), 103; *Chem. Abstr.*, 1964, **61**, 11847 *a*].

***C. flexuosus** (Steud.) Wats. syn. *Andropogon nardus* var. *flexuosus* Hack.
English–*Malabar lemongrass*.
Mal.–*Kodipullu*.
The oil is used in perfumery, soaps and cosmetics and as mosquito repellent. The oil is the principal source of citral from which ionone is derived. β-Ionone is the starting material for vitamin A synthesis (*Chem. Tr. J.*, 1949, **124**, 463).
Essen. oil (yield 0·4%), contains geranic acid, methylheptenone, citral, *p*-cyamene, myrcene and geranyl salicylate (*Perfum. essent. Oil Rec.*, 1961, **52**, 344).
Malabar Coast.

***C. martini** (Roxb.) Wats. syn. *Andropogon martini* Roxb.
English–*Rosha-grass*.
S.–*Rohisa*; H.–*Gandh bel*; Tam.–*Kavathum pillu*.
Two varieties—*motia* and *sofia*; the former yields palmarosa oil with 90-95% geraniol content and the latter gingergrass oil.
Essen. oil (Rosha-grass oil) (*Indian Soap J.*, 1955, **20**, 209; *Indian J. Pharm.*, 1958, **20**, 70). Isolation of geraniol from rosha oils (*J. Proc. Oil Tech. Ass. India*, 1953, **9**, 42; 1956, **12**, 53; 1957, **13**, 52). Effect of season on yield and composition of oil (*Indian Soap J.*, 1951, **16**, 205).
Rosha-grass grows in drier localities of India—Maharashtra and Madhya Pradesh. Gingergrass in Bengal, Madras and Punjab.

C. nardus (Linn.) Rendle
Essen. oil (*Indian Soap J.*, 1953, **19**, 8; *Perfum. essent. Oil Rec.*, 1954, **45**, 184; 1955, **46**, 365; *Indian Oil Soap J.*, 1960, **25**, 246). The oil contains γ-cadinene and elemicin, previously reported as hydrocarbon B and alcohol B respectively (*Perfum. essent. Oil Rec.*, 1956, **47**, 157). Formation of essen. oil and components in Ceylon type citronella grass in India [*Fr. Parf.*, 1961, **4**(21), 179; *Chem. Abstr.*, 1965, **62**, 1509*f*].

C. schoenanthus (Linn.) Spreng. syn. *C. densiflorus* Stapf
Flowers yield 3% of essen. oil similar to cumin oil which can replace gingergrass oil in perfumery (*Riechstoffe Aromen*, 1960, **10**, 4; *Chem. Abstr.*, 1964, **61**, 2897 *h*).

CYPERUS (*Cyperaceae*)

C. rotundus Linn.
Tubers yield essen. oil of antibiotic activity, i.e. it arrests the growth of *Micrococcus pyrogenes* var. *aureus* (*Curr. Sci.*, 1956, **25**, 118).

C. scariosus R. Br.
Tubers yield essen. oil which could replace patchouli oil. Physical data (*Curr. Sci.*, 1951, **20**, 273; *Perfum. essent. Oil Rec.*, 1957, **48**, 112).

CYTISUS (*Leguminosae*)

C. scoparius Link syn. *Sarothamnus scoparius* Koch
English–*Scotch broom*; *Common broom*; *Scoparius*.
Scoparius is diuretic and cathartic and in large doses emetic and has been employed in dropsy.
The circulatory or cardiac therapeutic value of the drug is due to the alk. present, no active sterol or triterpenes found (*Planta Med.*, 1956, **4**, 104; *Chem. Abstr.*, 1957, 7651 *b*).
Sparteine determination by paper chromatography (*Dtsch. Apoth.-Ztg.*, 1958, **98**, 832; *Chem. Abstr.*, 1961, 14820).

DALBERGIA (*Leguminosae*)

D. sissoo Roxb.
Essen. oil from wood contains bisabolene 9·98% and nerolidol 66·40% (*Indian Soap J.*, 1952, **17**, 285).

DAPHNE (*Thymelaeaceae*)

D. oleoides Schreb.
Chemical examination of leaves: fractions showed slight zones of inhibition only against *Micrococcus pyrogenes* var. *aureus* and *B. friedlanders* (*Indian J. Pharm.*, 1960, 13).

DATURA (*Solanaceae*)

D. innoxia Mill.
Roots contain tigloidine, atropine, tropine, pseudotropine and another base, as also 7-hydroxy-3α, 6β-digiloyloxytropane, (—)-3α, 6β-digiloyloxytropane, hyoscine and meteloidine (*J. chem. Soc.*, 1959, 1406). Total alks. in leaves 0·16-0·25%, herbs 0·23-0·36%, stalks 0·11-0·12%, seeds 0·38-0·45%, seed pods 0·20% and roots 0·15-0·48%; scopolamine yield 48-72% of total alks. from seeds, 28-34% from vegetative parts, 68-75% of total alks. in leaves, 52-70% in the herb, 97% in seed powder, 46% in stalks and 16% in roots (*Dissnes pharm., Warsz.*, 1960, **13**, 187, 259). Seeds of the upper part of the plant contain the highest amount of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

scopolamine while those of the lower part contain the lowest amount; harvesting in early period gives high yields (*Med. Prom. SSSR*, 1960, **14**, No. 11, 16; *Chem. Abstr.*, 1961, 1583 *d*). Isolation of a new alk. from roots (*Pharm. Acta Helvet.*, 1955, **30**, 279; *Chem. Abstr.*, 1956, 1261 *h*).

D. metel Linn. syn. *D. alba* Nees.

Leaves—maximum alkaloidal contents in winter; economic source of hyoscine from plants fed on organic N-compound (*Indian Pharm.*, 1951, **6**, 201). Mode of drying of leaves, no effect on their alkaloidal contents (*J. sci. industr. Res.*, 1953, **12B**, 506). Size of leaves has no effect on their alkaloidal contents (*Indian J. Pharm.*, 1954, **16**, 24). Leaves contain the maximum percentage of alks. mainly hyoscine (*Indian J. Pharm.*, 1951, 187). Leaves of Rumanian plants yield scopolamine, 45% of the total alks. (*Farmacia, Buc.*, 1959, **7**, 23540). Method of extn. of scopolamine from the leaves (*Dissnes pharm., Warsz.*, 1956, **7**, 179; *Biol. Abstr.*, 1959, 42815). Flowers contain highest percentage of alks., leaves more hyoscyamine, flowers and herbs more hyoscine (*Indian J. Pharm.*, 1963, **25**, 370). Sepn. and estimation of hyoscine and hyoscyamine of high R_f value (*Indian J. Pharm.*, 1964, **26**, 107).

Roots, thicker than 0·5 cm., give 0·28% of alks. and thinner than 0·5 cm., between 0·13 and 0·15% (*Indian J. Pharm.*, 1965, **15**, 292).

D. stramonium Linn.

Tropine alks. 0·403% (*Dissnes pharm., Warsz.*, 1951, **3**, 159; *Chem. Abstr.*, 1952, 11587 *h*). To obtain maximum alks., plants kept in total darkness for 24 hours (*Acta polon pharm.*, 1953, **10**, 53; *Chem. Abstr.*, 1954, 14109 *i*). Application of ultra sound for increasing alkaloidal yield (*J. Pharm. Sci.*, 1964, **53**, 945; *Chem. Abstr.*, 1964, **61**, 11847 *d*).

DAUCUS (*Umbelliferae*)

D. carota Linn.

Green carrot yields a glycosidal bitter principle (0·23%) and an ethereal oil (0·03%), no tannins and no saponins; presence of (Protoalkaloids), pyrrolidine and daucine (*Arch. Pharm. Berl.*, 1951, **284**, 8; *Chem. Abstr.*, 1951, 7305 *c*). Yields luteolin 7-glucoside (*Yakugakuzasshi*, 1960, **80**, 1473; *Chem. Abstr.*, 1961, 5871 *f*).

Essen. oil from wild carrot from southern USSR contains 50% geraniol (*Zh. prikl. Khim.*, 1955, 28, 1355; *Chem. Abstr.*, 1956, 5988 *i*). Essen. oil from seeds [*Trudy bot. Inst. Akad. Nauk SSSR*, 1955, **5**, 7; *Chem. Abstr.*, 1956, 17340 *d*; *J. Proc. Oil Tech. Ass. India*, 1958, **12**(11), 119; *Saugar Univ. J.*, 1958, **7**(11), Sec. A, No. 7, 49]. The oil gives +ve test for glycoside, hypotensive effect in anaesthetized animals, depresses respiration and relaxes smooth muscles (*Indian Pharm.*, 1953, **8**, 291). Occurrence of mevalonic acid (*Nature, Lond.*, 1961, 1202). Fruits of *D. carota* and *D. aureus*, isolation of compds. and their chemistry (*Yao Hsueh Hsueh Pao*, 1957, **5**, 157; *Chem. Abstr.*, 1962, 540 *h*).

Essen. oil from seeds, yield 1%, with daucol 11·3%, and carotal 70% (*Perfum. essent. Oil Rec.*, 1963, **54**, 87; *Indian Oil Soap J.*, 1963, **28**, 249).

DELPHINIUM (*Ranunculaceae*)

***D. consolida** Linn.

English–*Forking larkspur.*

A possible insecticide.

Flowers contain a diglycoside pigment, delphonin and kaempferol.

Seeds contain total alks. (1·01-1·06%), of which crystallines are delcosine, delsoline and consolidine (*Wlth India*, **III**, 31).

Cultivated in gardens : India.

D. denudatum Wall.

Roots yield two new alks., one of which is denudatine (*J. sci. industr. Res.*, 1961, **20B**, 39).

D. elatum Linn.

Ext. has action of curare-like drugs, elatine (ext. of *D. elatum*), melliktin (mellictine) and kobanin on central nervous system (*Nauch. Soobschch. Inst. Fiziol. Akad. Nauk SSSR*, 1959, 218; *Biol. Abstr.*, 1961, 80556).

DENDROBIUM (*Orchidaceae*)

***D. densiflorum** Wall. syn. *D. thyrsiflorum* Reichb. f.

Leaf contains ayapin, scopoletin and 6,7-dimethoxycoumarin, occurring in combination probably as glucosides (*Nature, Lond.*, 1960, **188**, 1108).

Tropical Himalayas from Nepal to Khasia Hills.

***D. thyrsiflorum** Riechb. f.; see **D. densiflorum** Wall.

DESCURAINIA (*Cruciferae*)

D. sophia (Linn.) Webb.

Seeds yield an essen. oil containing isothiocyanate, allyl isothiocyanate and allyl disulphide. The fatty oil of the seeds contains linolenic acid, linoleic acid, oleic acid, erucic acid, palmitic acid and stearic acid; semidrying class of oil (*Indian J. appl. Chem.*, 1959, **22**,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

No. 3, 122). Also yield essen. oil (0·025%) (*J. Indian chem. Soc.*, 1960, **37**, 317).

DESMODIUM (*Leguminosae*)

D. gangeticum DC.

Roots and seeds are used as febrifuge and anticatarrhalic drug in India.

Seeds showed the presence of sugars, fatty oil and alks. [*Arch. Pharm. Berl.*, 1955, **268**(60), 272].

DICHROA (*Saxifragaceae*)

D. febrifuga Lour.

A source of effective remedy against malaria, cultivated in USSR (*Aptech. Delo*, 1958, 7, No. 4, 17).

*DICRANOSTIGMA (*Papaveraceae*)

D. lactucoides Hook. f. & Thoms.; see **Stylophorum lactucoides** Hook. f. & Thoms.

DICTAMNUS (*Rutaceae*)

D. albus Linn. syn. *D. hispanicus* Webb., *D. himalayanus* Royle

Essen. oil from fresh flowering plant (yield 3% on dry wt.) contains estragol 70%, dilimonene and dipentene 16% (*An. Real Soc. Espan. Fis. Quim.*, 1951, **47B**, 171; *Chem. Abstr.*, 1951, 5880 *i*).

Roots contain the highest amount of alkaloidal contents (0·19-0·39%) and oil content (0·11-0·88%) (*Dissnes pharm., Warsz.*, 1960, **12**, 229; *Chem. Abstr.*, 1961, 4887*f*). Roots contain large amounts of dictamnine and also draggendorff-pos substances, while the leaves contain draggendroff-pos substances, skimmianine and traces of dictamnine (*Naturwissenschaften*, 1961, **48**, 63; *Chem. Abstr.*, 1961, 13776 *f*). Dictamnine in roots 0·029% and skimmianine in the dried herb 0·07% (*Acta polon pharm.*, 1961, **18**, 97; *Chem. Abstr.*, 1962, 7424 *a*).

Dictamnine colorimetric estimation (*Dissnes pharm., Warsz.*, 1959, **11**, 333; *Biol. Abstr.*, 1960, 39411).

DIGITALIS (*Scrophulariaceae*)

D. lanata Ehrh.

Glycoside contents of leaves affected by drying methods (*J. Pharm., Lond.*, 1956, **6**, 471). Unlike *D. purpurea* highest yield is by tray drying the leaves at room temperature; lanatosides A and B in this species are lowered by 10% at room temperature drying, the maximum is obtained at 40°C. drying (*Arch. Pharm. Berl.*, 1960, **293**, 414; *Chem. Abstr.*, 1961, 3927 *h*). Lanatosides A, B and C in leaves, chromatographic estimation (*Indian J. Pharm.*, 1964, **26**, 107).

Leaves evaluation (*Pharmazie*, 1957, **12**, 433; *Chem. Abstr.*, 1958, 3259 *i*). Total lanatosides and leafy material yield in diploid and tetraploid strain (*Pharmazie*, 1964, **19**, 38; *Chem. Abstr.*, 1964, **60**, 14331 *h*).

New glycoside isolation, diginatin, cardioactive (*J. Amer. pharm. Ass.*, 1955, **44**, 719); lanatoside, superior therapeutic preparation to the one from *D. purpurea* (*Aptech. Delo*, 1955, **4**, No. 4, 45; *Chem. Abstr.*, 1956, 535 *g*). Lantoside E, a new glycoside (*Helv. chim. acta*, 1958, **41**, 479; *Biol. Abstr.*, 1958, 38544). β-Acetyldigoxin (*Indian J. Pharm.*, 1955, **17**, 253); digoxigenin and bidigitoxoside, two cardiac glucosides (*Naturwissenschaften*, 1957, **55**, 633; *Chem. Abstr.*, 1958, 11318 *c*); acetylgitaloxin from leaves (*Chem. Abstr.*, 1959, 650*g*); digoxin and digitoxin determination in leaves (*J. Pharm. Lond.*, 1958, **10**, 183); neodigoxin, from the fermented leaves and its toxicity compared to digoxin (*Naturwissenschaften*, 1959, **46**, 447; *Chem. Abstr.*, 1960, 5018 *i*); tigogenin from the aq. exts. (*J. Amer. pharm. Ass.*, 1956, **45**, 581).

Development of digoxin during the drying and extraction of the leaves (*Aust. J. Pharm.*, 1959, 1067; *Biol. Abstr.*, 1960, 35744).

Fatty oil from seeds, its constituents (*Zh. prikl. Khim., Mosk.*, 1955, **28**, 334; *Chem. Abstr.*, 1955, 7809 *a*).

D. purpurea Linn.

Glycosides from the leaves, digitoxin and gitoxin, sepn. and purification (*Japan Patent* 4941, 53); digitoxin content of leaves (*J. Pharm., Lond.*, 1956, **8**, 1061); gitorin (gitoxigenin, monoglycoside) isolation (*Pharm. Bull.*, 1953, **1**, 304); strospeside, isolation (*J. pharm. Soc. Japan*, 1954, **74**, 500; *Chem. Abstr.*, 1954, 10298 *e*); digitalinum verum, sepn. from leaves (*J. pharm. Soc. Japan*, 1954, **74**, 474; *Chem. Abstr.*, 1954, 10298 *c*); digitoxin, gitoxin, purpurea glucoside A and B, strospeside, digitalinum verum, gitorin and diginum, cardiotonic components of dried leaves (*J. pharm. Soc. Japan*, 1955, **75**, 611; *Chem. Abstr.*, 1955, 12778 *d*); diginin, oxydigin, $C_{28}H_{40}O_9$ needles, having no cardiotonic activity and a glycoside, m. 282-87° recovered from leaves (*J. pharm. Soc. Japan*, 1955, **75**, 1025; *Chem. Abstr.*, 1956, 533 *d*); odoroside H., digiproside and digitalonin isolation (*Pharm. Bull. Tokyo*, 1956, **4**, 284; *Chem. Abstr.*, 1957, 7650 *d*); digitoxin, gitatoxin, gitoxin, digitoxigenin, gitoxigenin, purpurea glucoside A and B, strospeside and glucogitatoxin [*Naturwissenschaften*, 1955, **42**(15, 13), 441,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

391; *Biol. Abstr.*, 1957, 5766, 5767; *Naturwissenschaften*, 1956, **43**, 158; *Chem. Abstr.*, 1958, 14090 *h*]; glucodigifucoside, a new cardiotonic glucoside (*Pharm. Bull. Tokyo*, 1957, **5**, 272; *Chem. Abstr.*, 1958, 4926 *g*); mixture of deacetyldigilanide A and B, digitoxin and gitoxin (*J. Pharm., Lond.*, 1958, **10**, 228). Chemical evaluation of drugs for digitoxin and gitatoxin (*Sci. pharm.*, 1963, **31**, 124; *Analyt. Abstr.*, 1964, **11**, 2774).

Water-sol. glycosides from the leaves, isolation (*Pharm. Bull.*, 1953, **1**, 305; *Chem. Abstr.*, 1955, 4944 *i*); water-sol. fraction of dried leaves less cumulative than digitoxin or digoxin but has action like strophanthus (*Pharmazie*, 1954, **9**, 589; *Chem. Abstr.*, 1955, 9883 *a*); strospeside, a water-sol. glucoside, isolation (*Rep. Shionogi Res. Lab.*, 1954, No. 4, 381; *Chem. Abstr.*, 1957, 7657 *d*); water-sol. glucosides from leaves, their estimation [*Japan Patent* 4896 (57)]; digiproside, a water-sol. cardioglycoside [*Japan Patent* 1958 (59)].

Chemical assay of the genuine and secondary glycosides and aglycones of the leaves (*Pharm. Weekbl.*, 1953, **88**, 237). Paper chromatographic investigation of leaves exts. for the purpurea glycosides A and B, digitoxin, gitoxin, gitoxigenin, diginin and a saponin (*Pharmazie*, 1955, **10**, 725; *Chem. Abstr.*, 1956, 5363 *c*); chemical assay of leaves (*Pharm. Weekbl.*, 1957, **92**, 877; *Chem. Abstr.*, 1958, 4110 *a*); standardization of leaves should correspond to an av. of total glycosides as well as the amount of each glycoside (*Farmacia, Buc.*, 1960, **17**, 255); glycosidal content of British clones and glycosidal content within clones (*J. Pharm., Lond.*, 1960, **12**, Suppl. 66T-72T).

Glycoside content of the drug, amorphous glycosides, isolation (*Przem. chem.*, 1960, **39**, No. 3, 175; *Chem. Abstr.*, 1960, 23138 *i*); individual glycosides in digitalis leaf and preparations (*Pharm. Weekbl.*, 1963, **98**, 569; *Analyt. Abstr.*, 1964, **11**, 744).

Tray-drying of leaves at room temperature gives the highest yield of primary glucoside, unlike *D. lanata* (*Arch. Pharm. Berl.*, 1960, **293**, 414; *Chem. Abstr.*, 1961, 3927 *h*); method of drying influences the biological activity (*Ann. pharm. franc.*, 1957, **15**, 321; *Chem. Abstr.*, 1958, 659 *f*); fermentation of leaves increases gitoxigenin contents but not the digitoxigenin contents (*Pharm. Weekbl.*, 1958, **93**, 819; *Chem. Abstr.*, 1958, 29898 *i*); fermentation effects on the chloroform-sol. glucosides contents in the leaves (*Pharm. Weekbl.*, 1956, **91**, 937). Activity of leaves, diurnal cycle (*Dissnes pharm., Warsz.*, 1956, **7**, 165; *Biol. Abstr.*, 1959, 42830). Conversion of primary glucosides to easily sol. ones by drying at 20° for 14 days or 40° for 3 days [*Sci. pharm.*, 1964, **32**(2), 127; *Chem. Abstr.*, 1964, **61**, 10534 *b*].

Glucosides, digitonin isolation from seeds (*J. pharm. Soc. Japan*, 1955, **75**, 25; *Chem. Abstr.*, 1955, 6545); strospeside, gitoxin and digitogenin glucosides isolation from seeds (*Rep. Shionogi Res. Lab.*, 1955, **5**, 113; *Chem. Abstr.*, 1956, 17331 *c*).

Action on pulmonary blood vessels (*Indian J. med. Res.*, 1964, **52**, 292).

Cardioglycosides from seeds by paper-partition chromatography (*Pharm. Bull. Tokyo*, 1957, **5**, 157); gitostin, a new cardiotonic glycoside from seeds (*Pharm. Bull. Tokyo*, 1957, **5**, 163); enzymic decomposition of gitostin (*Pharm. Bull. Tokyo*, 1957, **5**, 167); acetates of cardiotonic glucosides (*Pharm. Bull. Tokyo*, 1957, **5**, 171; *Chem. Abstr.*, 1957, 18471 *d*). Thin layer chromatography of cardiac glycosides (*Acta polon. pharm.*, 1963, **20**, 115; *Analyt. Abstr.*, 1964, 11744). Gitalin, a mixture of three major cardioactive glycosides (*Amer. J. Pharm.*, 1964, **136**, 71; *Chem. Abstr.*, 1964, **61**, 5452 *e*).

Non-cardiotonic glucosides—pharmacological study (*Therapie*, 1959, **14**, 290; *Biol. Abstr.*, 1961, 72323).

Saponins in digitalis (*Pharm. Zentralh.*, 1959, **98**, 437; *Chem. Abstr.*, 1960, 819 *e*).

Paper chromatography of spray-dried press-juices of *D. purpurea* and *D. lanata* (*Farm. Notisbl.*, 1962, **71**, 233; *Chem. Abstr.*, 1963, 412 *a*).

DIOSCOREA (*Dioscoreaceae*)

Dioscorea sp. contains steroid sapogenins, traces of saponin (*J. Indian chem. Soc.*, 1956, **33**, 799). Isolation of saponin from Indian Dioscorea yams (*Bull. Calcutta Sch. trop. Med. Hyg.*, 1963, **11**, 20).

D. deltoidea Wall.

Diosgenin contents of tubers from J. & K. State at various stages of growth (av. 4·8%) (*Indian J. Pharm.*, 1955, **17**, 142); steroid sapogenins from Indian Dioscorea spp. (*J. Indian chem. Soc.*, 1956, **33**, 799). Action of saponases on the drug-yield diosgenin and smilagenon (*Bull. Calcutta Sch. trop. Med. Hyg.*, 1960, **8**, 58; *Nature, Lond.*, 1960, **186**, 236). Yield, epi-smilagenin and smilagenone instead of diosgenin when tubers are immersed in water

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(*J. sci. industr. Res.*, 1964, **23**, 493). Method for isolation of saponin (*Bull. Calcutta Sch. trop. Med. Hyg.*, 1963, **11**, 20).

D. esculenta Burkill syn. *D. aculeata* Linn.

Steroid sapogenins from Indian Dioscorea sp. (*J. Indian chem. Soc.*, 1956, **33**, 799).

D. hispida Dennst.

Steroid sapogenins from this species contain traces of saponin (*J. Indian chem. Soc.*, 1956, **33**, 799), also an alk., dioscorine and its oxo-base by degradation (*J. chem. Soc.*, 1963, 1841).

D. prazeri Prain & Burkill

Diosgenin isolation from yams (*Indian Patent* 58383, 1957; *J. Instn Chem. India*, 1958, **30**, 106; 1959, **31**, 218). Diosgenin extn. on elution with benzene for quantitative estimation (*Med. Prom. SSSR*, 1958, **12**, No. 8, 28; *Chem. Abstr.*, 1959, 13501*g*). Action of saponases on the drug-yield diosgenin and smilogenin (*Bull. Calcutta Sch. trop. Med. Hyg.*, 1960, **8**, 58). Fermentation of comminuted tubers for 1-21 days does not increase the yield of diosgenin (*J. Agric. Univ. P. R.*, 1961, 119; *Biol. Abstr.*, 1961, 54231).

***D. tomentosa** Heyne

Steroid sapogenins from Indian Dioscorea sp. (*J. Indian chem. Soc.*, 1956, **33**, 799).

Deccan Peninsula from Kanara southwards and Ceylon.

DIOSPYROS (*Ebenaceae*)

D. ebenum Koenig syn. *D. hebecarpa* A. Cunn. ex Benth.

Occurrence of lupeol group of triterpenoids responsible for poisonous and vesicant properties (*Curr. Sci.*, 1964, **33**, 367).

D. kaki Linn. f.

Flavonoid, astragetin, 0·02% yield (*Yakugakuzasshi*, 1960, **80**, 1298). Wood contains sitosterol.

D. lotus Linn.

Flavonoid, myricitrin, 0·15% yield (*Yakugakuzasshi*, 1960, **80**, 1298).

D. melanoxylon Roxb.

Bark and sapwood exts. yield β-sitosterol, lupeol, betulin and betulinic acid (*Indian J. Chem.*, 1964, 467).

D. peregrina Gurke.

Leaves yield β-sitosterol, betulin and oleanolic acid (*Indian J. Chem.*, 1964, 467). Bark contains betulinic acid (*Curr. Sci.*, 1964, 367).

DIPTEROCARPUS (*Dipterocarpaceae*)

D. indicus Bedd.

Oleo-resin yields an essen. oil containing, besides others, hydrocarbon β-caryophylline (*Sci. & Cult.*, 1960, **16**, 74).

DODONAEA (*Sapindaceae*)

D. viscosa Linn.

β-Sitosterol and stigmasterol isolated from the leaves (*J. Indian chem. Soc.*, 1962, 561).

DOLICHOS (*Leguminosae*)

D. biflorus Linn.

Strepogenin several times higher than in casein (*Indian J. Physiol. all. Sci.*, 1951, **5**, 83). Seeds contain β-sitosterol (*Bull. Calcutta Sch. trop. Med.*, 1955, **3**, 109).

D. lablab Linn.

Isolation, fractionation and analysis of proteins from bean (*Ann. Biochem.*, 1960, 257); *in vitro* digestibility of the proteins (*Ann. Biochem.*, 1960, 261).

Enzymic liberation of essen. amino acids from the proteins slower than from casein and wheat [*J. postgrad. Med.*, 1961, **7**(4), 158].

DOREMA (*Umbelliferae*)

D. ammoniacum D. Don

Gum constituents: glucuronic acid, galactose, arabinose and rhamnose and a ketone (*Ann. pharm. franc.*, 1958, **16**, 665; *Chem. Abstr.*, 1959, 12587 *g*).

DRACOCEPHALUM (*Labiatae*)

***D. stamineum** Kar. & Kir.

Essen. oil, containing citral, nerol, geraniol, free and as esters, azulene and linalool traces (*Izv. Akad. Nauk. Kazakh. SSR*, 1956, No. 9, 50; *Chem. Abstr.*, 1956, 9693 *e*).

Introduced into Kashmir Himalayas.

DROSERA (*Droseraceae*)

D. indica Linn.

Isolation of plumbagone from this plant and other species. Plumbagone depresses the isolated intestine of the guinea-pig and suppresses the effect of acetylcholine (*Ann. pharm. franc.*, 1959, **17**, 585; *Biol. Abstr.*, 1961, 69684).

DRYOPTERIS (*Polypodiaceae*)

D. filix-mas (Linn.) Schott.

Crude filicin content 4% high toxicity for *Enchytracus albidus*, 10 mg./100 ml. (*Dissnes pharm., Warsz.*, 1959, **11**, 355; *Chem. Abstr.*, 1960, 13555 *i*). Isolation, determination and biological activity of the active constituents of rhizomes:

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

filicin, α-flavospidic acid, and filicic acid (*Ann. Univ. M. Curie-Sklodowska*, 1959, Sect. D 14, 291; *Chem. Abstr.*, 1961, 10808 *f*). Evaluation of the therapeutic efficacy of the rhizomes [*Dissnes pharm., Warsz.*, 1961, 193; *Biol. Abstr.*, 1961, 73914). Preparation of filicin [*Farmatsiya Sof.*, 1962, **12**(5), 34; *Chem. Abstr.*, 1964, **61**, 15929 *f*].

DURANTA (*Verbenaceae*)

D. repens Linn.

Constituents of fruits (*J. Indian chem. Soc.*, 1960, 697).

ECBALLIUM (*Cucurbitaceae*)

D. elaterium A. Rich.

Roots contain analgesic principle (*Sci. pharm.*, 1963, **31**, 241; *Chem. Abstr.*, 1964, **60**, 6701 *a*).

ELAEAGNUS (*Elaeagnaceae*)

E. umbellata Thunb.

Kumaon–*Geowain*.

Flowers astringent. Seeds used in pulmonary affections.

Found from Kashmir to Nepal, alt. 1-3000 m.

EMBELIA (*Myrsinaceae*)

E. ribes Burm. f.

Embelin as vilangin, estimation in berries of *E. ribes* and *E. robusta* (*Indian J. Pharm.*, 1961, 262, 330).

Anthelmintic activity of seeds significant against *Taenia cannina* and *Paraphistonum carvi* (*J. Indian med. Ass.*, 1963, **41**, 435). Pharmacological, anthelmintic and antibacterial action (*Indian J. Pharm.*, 1964, **26**, 168). Efficacy against ascariasis in human beings (*Antiseptic*, 1964, **61**, 545; *Indian J. Pharm.*, 1964, **26**, 250).

EMBLICA (*Euphorbiaceae*)

E. officinalis Gaertn. syn. *Phyllanthus emblica* Linn.

Chromatographic study of the exts. of dried fruit shows tannins and colloidal complexes (*J. sci. industr. Res.*, 1956, **15C**, 205). Phyllemblic acid, the chief constituent (*Bull. Res. Inst. Univ. Travancore*, 1959, Ser. A, 6, 21). Fruit contains phyllemblic acid (6·3%), lipides (6%), gallic acid (5%) and emblicol; its pharmacological investigation on rabbits and dogs (*J. sci. industr. Res.*, 1959, **18C**, 180). Ascorbic acids, verified by paper chromatographic technique (*Indian J. Pharm.*, 1962, **24**, 2). Crystalline vitamin C isolated from the fruit pericarp in a yield of 70-72% of the total (*J. sci. industr. Res.*, 1962, **21B**, 347). Isolation of mucic acid (*Curr. Sci.*, 1962, 13).

Phyllembin, from fruit pulp identified as ethyl gallate. It potentiates pharmacologic action of adrenalin *in vitro* and *in vivo*. Has mild depressant action on central nervous system and spasmolytic action (*Indian J. exp. Biol.*, 1964, **2**, 29; *Indian J. Pharm.*, 1964, **26**, 178). Leucodelphinidin, a chemical constituent of the bark (*J. sci. industr. Res.*, 1958, **17B**, 167).

ENICOSTEMMA (*Gentianaceae*)

E. littorale Blume.

Phytochem. investigation of the whole plant (*Indian J. Pharm.*, 1959, 69). Alks. and their pharmacological effects (*Indian J. Pharm.*, 1960, 252).

ENTADA (*Leguminosae*)

E. phaseoloides Merrill syn. *E. pursaetha* DC., *E. scandens* Benth.

Sapogenin of saponin identified as oleanolic acid (*Arch. Pharm. Berl.*, 1954, **287**, 131; *Chem. Abstr.*, 1954, 11004 *e*). From seeds, a new triterpenoid, entagenic acid, crystalline sapogenin (*Sci. & Cult.*, 1954, **20**, 199).

The seeds yield substances toxic to Xenopus larvae and with hemolysed blood; xenopus index 400 and hemolytic index 150 (*J. Pharmacol.*, 1960, **12**, 631).

EPHEDRA (*Gnetaceae*)

E. gerardiana Wall.

Ephedrine-HCl manufacture (*Ann. Biochem.*, 1956, **16**, 100). Pakistan ephedra total alk. (1·0-2·5%) [*Econ. Bot.*, 1957, **11**(3), 257].

EQUISETUM (*Equisetaceae*)

E. arvense Linn.

Herb used to increase milk production in cows; review of literature on its chem. compn. (*Rev. Farm. Bucuresti*, 1953, **95**, 3).

ERIGERON (*Compositae*)

E. canadensis Linn.

Essen. oil of plant (yield 0·36%) contains linalool, linalyl acetate and aldehydes, suitable for perfumery (*Zh. prikl. Khim. Mosk.*, 1960, **33**, 444; *Chem. Abstr.*, 1960, 11386 *f*).

ERIOBOTRYA (*Rosaceae*)

E. japonica Lindl.

Plant used medicinally in Hong Kong; contains ursolic acid, oleanolic acid, etc. (*J. chem. Soc.*, 1954, 2782).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ERODIUM (*Geraniaceae*)

E. cicutarium L'Herit.
English–*Stork's bill.*
Herb used as a uterine sedative and a haemostatic; compds. isolated: caffeine, tannic acid, fructose, glucose and suffinose, etc. (*Pharm. Lab. Rijks. Univ. Utrecht.*, 1951, 89; *Chem. Abstr.*, 1952, 9262 *a*). The sap of the plant contains histamine, putrascine, tyramine, pyrocatechol and succinic acid (*Pharm. Weekbl.*, 1957, **92**, 581; *Chem. Abstr.*, 1957, 18483 *b*).

ERUCA (*Cruciferae*)

E. sativa Mill.
Powdered seeds possess antibacterial activity, but no alks. (*Bull. reg. Res. Lab. Jammu*, 1963, **1**, 197).

ERVATAMIA (*Apocynaceae*)

E. coronaria Stapf = **E. divaricata** (Linn.) Alston
Bark gives triterpenes: α-amyrin and its acetate; lupeol and its acetate; and β-sitosterol [*J. Indian chem. Soc.*, 1957, **34**(12), 912].

E. heyneana T. Cooke syn. *Tabernaemontana heyneana* Wall.
Bark on extn. with alcohol yields 3 triterpene alcohols, viz. lupeol and two isomers (*J. sci. industr. Res.*, 1955, **14B**, 424).

ERYTHROXYLUM (*Erythroxylaceae*)

E. coca Lam.
Leaves from Bolivia and Huanuco contain alks. cocaine, cuscohygrine and in Java and Truxillo, cinnamyl cocaine; stems and roots lack ecgonine (*Pharm. Acta Helvet.*, 1960, **35**, 43; *Chem. Abstr.*, 1960, 17791 *f*).

E. monogynum Roxb.
Essen. oil, greenish, from steam distillation of wood of Royalaput variety —16·6% (*J. Indian Inst. Sci.*, 1954, **36A**, 76).

EUCALYPTUS (*Myrtaceae*)

E. citriodora Hook.
Guaiol occurrence in essen. oil (*Mus. Technol. appl. Sci.*, 1950, **2**, 15; *Chem. Abstr.*, 1951, 2153 *a*).
Essen. oil (*Bull. agric. Congo belge*, 1953, **44**, 319; *Chem. Abstr.*, 1954, 9576; *J. Proc. R. Soc. N.S. W*, 1953, **87**, 24; *Chem. Abstr.*, 1954, 6654 *h*; *Indian J. agric. Sci.*, 1955, **25**, 73). From plants raised in Jammu, yield 1% [*Indian Oil Soap J.*, 1963, **29**(6), 160].
Chemical and antibacterial properties of kinos from *E. citriodora*, *E. globulus*, *E. pilularis* and *E. robusta* (*J. Indian Inst. Sci.*, 1957, **39**, 195).

EUPATORIUM (*Compositae*)

E. cannabinum Linn.
Plant contains euparin, eupatoriopicrin etc.—review (*Pharmazie*, 1951, **6**, 686). Triterpene, taraxasterol (α-lactucerol), isolation of rutin (0·4%), sepn. from leaves (*Roczn. Chem.*, 1954, **28**, 197; *Chem. Abstr.*, 1954, 12378 *g*). Euparin, highest yield up to 0·34% found in cultivated plants (*Acta polon. pharm.*, 1958, **15**, 961; *Chem. Abstr.*, 1959, 6536 *e*).

E. odoratum Linn.
Essen. oil contains sesquiterpene alcohol 'eupatol' of the endulene group (*Perfum. essent. Oil Rec.*, 1956, **47**, 312).

EUPHORBIA (*Euphorbiaceae*)

E. antiquorum Linn.
Triterpenoids from stems and latex (*Curr. Sci.*, 1964, 583). Triterpenoids: taraxerol and epi-friedelanol from stem-bark (*Indian J. Chem.*, 1964, **2**, 298).

E. dracunculoides Lam.
Leaves and stalk contain a glycoalkaloid, euphorbine, and the seeds, a phenolic substance besides a high percentage of fixed drying oil (*Indian J. Pharm.*, 1959, 258).

E. lathyrus Linn.
Seeds contain fatty oil, 42% yield, having oleic, linoleic, saturated aliphatic acids and glycerol (*C.R. Acad. bulg. Sci.*, 1961, **14**, 369; *Chem. Abstr.*, 1962, 555 *f*).

E. peplus Linn.
Poisonous, contains toxic substances in its latex (*Arch. Inst. Biol.*, 1959, 5587; *Biol. Abstr.*, 1961, **36**, 35301).

E. royleana Boiss.
Stems on petrol-ether extn. yield taraxerol; the flowers on ethanol extn., ellagic acid (*Indian J. Pharm.*, 1964, **2**, 254).

EVODIA (*Rutaceae*)

E. rutaecarpa Hook. f. & Thoms.
Assam–*Bora-asing, Muka-asing.*
Fruit constituents: evodin, evodiamine, rutaecarpine, evidinone and evogin (*Sci. Rec., Chungking*, 1951, **4**, 279; *Chem. Abstr.*, 1952, 11589 *a*). Main alk. from leaves: dehydro-evodiamine, yield 0·01% (*Yakugakuzasshi*, 1962, **82**, 619; *Chem. Abstr.*, 1963, 3470 *b*).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

EVOLVULUS (*Convolvulaceae*)

E. alsinoides Linn.
The plant contains an optically active alk., evolvine and optically inactive fatty residue. Crude mixture of alk. toxic to earthworm (*Indian J. Pharm.*, 1958, 100).

EXACUM (*Gentianaceae*)

E. bicolor Roxb.
Chemical examination of the plant (*J. sci. industr. Res.*, 1958, **17B**, 92).

FABA (*Leguminosae*)

***F. vulgaris** Moench; see **Vicia faba** Linn.

FAGOPYRUM (*Polygonaceae*)

F. cymosum Meissn.
Rutin content is affected by method of cultivation, time of collection and manner of drying the plant (*Rep. Takamine Lab.*, 1951, **3**, 45; *Chem. Abstr.*, 1954, 14119 *e*).
Rhizomes give a glycoside, shakurichin (*Kanazawa Daigaku Yakugakubu Kenkyu Nempo*, 1961, **II**, 1; *Chem. Abstr.*, 1962, 1526 *d*).

F. esculentum Moench
English–*Buckwheat*.
Variation in the flavonal content due to various factors—a review [*Pharmazie*, 1955, **10**(10), 609; (11), 679; *Biol. Abstr.*, 1957, 12078].
Rutin, extn. and cultivation of buckwheat (*J. pharm. Soc. Japan*, 1953, **73**, 1185; *Chem. Abstr.*, 1954, 3634 *g*; *Galenica Acta*, 1953, **6**, 305; *Chem. Abstr.*, 1954, 7851 *g*). Quantitative determination of rutin (*Farmatsiya Sof.*, 1961, **11**, No. 3, 23; *Chem. Abstr.*, 1961, 23927 *b*).
Rutoside preparation, a rapid method giving better yields (*Lucr. Prezentate Conf. nat. farm. Bucharest*, 1958, 403; *Chem. Abstr.*, 1959, 8537 *e*).

F. tartaricum Gaertn.
Variation in the flavonal content due to various factors—a review (*Pharmazie*, 1955, **10**, 609, 679).

FERONIA (*Rutaceae*)

F. limonia (Linn.) Swingle syn. *F. elephantum* Correa
Chemical examination of the plant; leaves contain stigmasterol (0·02%), bergapten (0·10%); unripe fruit contains stigmasterol (0·015%); root-bark contains feronialactones (*Ber. dtsch. chem. Ges.*, 1958, **91**, 34); bark contains marmesin (0·016%) (*J. sci. industr. Res.*, 1959, **18B**, 91). Chemical constituents (*Curr. Sci.*, 1959, 213).

FERULA (*Umbelliferae*)

F. alliacea Boiss.
Oleo-resin analysis (*J. Instn Chem. India*, 1956, **28**, 261).

F. foetida Regel
Gum-resin, a review (*J. sci. industr. Res.*, 1954, **13A**, 382); analysis (*J. Instn Chem. India*, 1956, **28**, 260).
Gum constituents: glucuronic acid, galactose, arabinose, rhamnose and a protein (*Ann. pharm. franc.*, 1958, **16** 665; *Chem. Abstr.*, 1959, 12587*g*).

F. jaeschkeana Vatke
Chemical examination of the essen. oil (*Indian J. Pharm.*, 1959, 39).

F. narthex Boiss.
Organic sulphur, estimation (*J. sci. industr. Res.*, 1957, **16B**, 508).

FICUS (*Moraceae*)

F. bengalensis Linn.
The relationship of the post-absorptive state to the hypoglycemic action of the bark (*Indian J. med. Res.*, 1960, 162).
Dried bark on extn. with 95% alcohol yields effective glycemic principles (*J. Pharmacol.*, 1961, 381).

F. carica Linn.
Isolation of proteolytic enzyme from the latex (*U.S. Patent* 2,694,034); isolation of psoralen, bergapten, taraxasterol and β-sitosterol (*J. chem. Soc.*, 1962, 4253).

F. racemosa Linn. syn. *F. glomerata* Roxb.
The relationship of the post-absorptive state to the hypoglycemic action of the bark (*Indian J. med. Res.*, 1960, 162).

F. religiosa Linn.
Bark contains 4% of tannin. Aq. ext. shows antibacterial activity against *Staph. aureus* and *Esch. coli* (*Indian J. med. Res.*, 1949, 169). Phytochemical investigations of the bark (*Indian J. Pharm.*, 1961, 74). Pharmacological effects—relaxant and spasmolytic on various smooth muscles (*Indian J. Physiol. Pharmac.*, 1960, 130; *Indian J. med. Res.*, 1960, 734).

FLEMINGIA (*Leguminosae*)

F. macrophylla Blume syn. *F. congesta* Roxb., *F. rhodocarpa* Baker
The drug on extn. yields flemingin, amorphous flemingin and homoflemingin (*Agrochimica*, 1957, **2**, 88; *Chem. Abstr.*, 1961, 26373 *c*).

***F. rhodocarpa** Baker; see **F. macrophylla** Blume syn. *F. congesta* Roxb.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

FLUEGGEA (*Euphorbiaceae*)

F. leucopyrus (Koen.) Willd. syn. *Securinega virosa* Baill.

Alk. virosecurinine — its structure (*Tetrahedron*, 1963, **19**, 609; *Chem. Abstr.*, 1964, **60**, 6456 *h*). Alks. viroallosecurinine and virosine (*Chem. & Ind.*, 1964, **28**, 1263).

F. virosa (Roxb. ex Willd.) Baill. syn. *F. microcarpa* Blume

Stem-bark, root-bark and total roots contain alk. Parts of the plant have foaming qualities (*Ann. pharm. franc.*, 1955, **13**, 245; *Chem. Abstr.*, 1955, 16345 *e*).

FOENICULUM (*Umbelliferae*)

F. vulgare Mill.

Essen. oil (*Indian Perfumer*, 1950, **5**, 401); oil of fennel (*Ber. dtsch. bot. Ges.*, 1953, **66**, 19; *Chem. Abstr.*, 1955, 5783*g*). Oil of fennel of Portugal; constituents, *d*-α-phellandrene, dipentene, fenchone, estragole, anisaldehyde and anisic acid (*Bol. Esc. Farm. Univ. Coimbra*, 1958, **18**, 1; *Chem. Abstr.*, 1959, 9580 *g*). Anethole sepn. from Rumanian oil by freezing at 300 atm. (*Lucr. Inst. Cere. aliment*, 1959, **3**, 99; *Chem. Abstr.*, 1961, 9795 *a*).

Leaves yield fenicularin, a quercetin 3-arabinoside (*Yakugakuzasshi*, 1959 **79**, 986; *Chem. Abstr.*, 1959, 20695 *a*), nelumboside flavonoid (*Yakugakuzasshi*, 1961, **81**, 1159; *Chem. Abstr.*, 1962, 1527 *d*).

FORTUNELLA (*Rutaceae*)

***F. japonica** (Thumb.) Swingle syn. *Citrus japonica* Thumb.

English–*Round* or *Marumi kumquat*.

Kumquats are rich in pectin and excellent for marmalades and jellies. Vitamin C content 0·13 and 0·24 mg./cc.

Fresh leaves and twigs yield an essen. oil (0·21%) (*Indian Perfumer*, 1957, **1**, 36).

Cultivated in gardens and hedges; native of South China.

FRAGARIA (*Rosaceae*)

***F. nubicola** Lindl.; see **F. vesca** Linn.

***F. vesca** Linn. syn. *F. nubicola* Lindl.

English–*Alpine strawberry*.

Fruit is astringent and diuretic; its red colour attributed to pelargonidin 3-galactoside.

Rootstock is used as a coffee-substitute in Kashmir.

Leaf infusion is given in diarrhoea and urinary affections. Leaves contain an ellagitannin (*Chem. Zbl.*, 1950, **II**, 2463; *Chem. Abstr.*, 1953, 8320 *i*).

Temperate Himalayas from Murree and Kashmir, 2000-3000 m., to Sikkim (2000-4000 m.).

FRAXINUS (*Oleaceae*)

F. excelsior Linn. syn. *F. hookeri* Wenz.

This species does not seem to occur in India, except perhaps where planted.

F. hookeri Wenz; see **F. excelsior** Linn.

F. ornus Linn.

The plant yields the *manna of commerce*. It is used as a mild laxative for children.

Bark of the branches yields esculin, while blossoms give cichorin, the only coumarin derivative (*Pharm. Acta Helvet.*, 1959, **34**, 334; *Chem. Abstr.*, 1960, 7064 *h*).

FRITILLARIA (*Liliaceae*)

F. imperialis Linn.

Review of the Chinese medicinal plant [*Farmak. Toks.*, 1957, **20**(1), 49; *Chem. Abstr.*, 1957, 10843 *a*]. Two new alks., minpaimine and minpaiminine (*K'O Hsueh T'ung Pao*, 1957, No. 1, 13). Identity of sipeimine with imperialine (*Chem. Abstr.*, 1959, 7503 *e*).

Found in Kashmir.

FUCUS (*Fucaceae*)

F. vesiculosus Linn.

Anticoagulant fractions from crude fucoidin [*Proc. Soc. exp. Biol., N.Y.*, 1957, **94**(2), 404].

FUMARIA (*Fumariaceae*)

F. parviflora Lam.

Non-alkaloidal constituents in leaves and stems: pentatriacontane, glucose, tannins and fumaric acid (*Pakist. J. sci. industr. Res.*, 1961, **4**, 121).

FURCRAEA (*Amaryllidaceae*)

***F. gigantea** Vent.

Leaves of plants cultivated in Egyp yield tigonin (0·083%), hecogenin and chlorogenin (0·25%) (*J. Chem. U.A.R.* 1961, **4**, 257; *Chem. Abstr.*, 1964, **60**, 366*b*).

American tropics. Grown in gardens or on hedges in India.

GALINSOGA (*Compositae*)

***G. parviflora** Cav.

Plant useful against nettle stings, when rubbed on the body.

Native of South America, introduced into India. A weed in cultivation on waste places in the Himalayas, alt. 1-2500 m.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

GALIUM (*Rubiaceae*)

***G. rotundifolium** Linn.

Plant is used in sore throat and chest complaint.

Throughout the Himalaya and Khasia Mts., alt. 1-3000 m. Western Peninsula; Nilgiri Mts.

GARCINIA (*Guttiferae*)

G. morella Desr.

Pericarp of the seeds yields 20% morellin, highly active compd. (*Indian J. Pharm.*, 1953, **15**, 316). Pure morellin from seed-coat husks (*Indian Patent* 73,823, 1962). Colouring matter isomorellin, desoxymorellin and dihydroisomorellin (*Indian J. Chem.* 1964, **2**, 402).

GARDENIA (*Rubiaceae*)

G. jasminoides Ellis.

Fruits contain nonacosane, β-sitosterol, D-mannitol and two others [*Yao Hsueh Hsueh Pao*, 1964, **11**(5), 342; *Chem. Abstr.*, 1964, **61**, 8130 *c*].

GAULTHERIA (*Ericaceae*)

G. fragrantissima Wall.

Khasi Hills–*Jirhap, Soh-ling-thrait.*

Leaves give oil of wintergreen (1·27%) (*Indian Oil Soap J.*, 1964, **29**, 227).

GELIDIUM (*Gelidiaceae*)

G. cartilagineum Gaill.

Analysis and structure of agar from China grass [*Canad. J. Chem.*, 1956, **34**(12), 1700; *Biol. Abstr.*, 1957, 12079].

Agar-agar [*Indian J. Technol.*, 1963, **1**(5), 222].

***GERARDINIA** (*Urticaceae*)

G. zeylanica Decne. syn. *G. heterophylla* Decne.

5-Hydroxytryptamine and histamine, pharmacologically active constituents from leaves (*J. Pharm. Lond.*, 1964, **16**, 361).

GLEDITSIA (*Leguminosae*)

***G. sinensis** Lam.

Pods are used as expectorant, emetic and purgative in China.

A native of China, cultivated in India.

***G. triacanthos** Linn.

English–*Common honey locust, Sweet locust, Gleditschia, Thorny acacia.*

Heartwood contains 4·0-4·8% tannin.

The plant contains triacanthine, hypoxysin and gummy matter. Action mydriatic, anodyne, narcotic.

Mature pods, air-dried, contain two colouring matters, viz. acramerrin and olmelin; while green pods yield a flavonoid glycoside (*Chem. Abstr.*, 1948, 4173; 1952, 9098).

The volatile fraction and the juice of the pods possess antibiotic activity against *Penicillium glaucum* and other microorganisms (*Hort. Abstr.*, 1952, 202).

The unsaponifiable fraction of seed-oil contains a phytosterol.

The leaves contain two active constituents—hypoxysin, of oxytocic properties and a neutral principle having a depressor action (*J. Amer. pharm. Ass.* 1934, **23**, 1198; *Chem. Abstr.*, 1948, 2690).

Native of America, cultivated in India as a roadside or hedge tree.

GLIRICIDIA (*Leguminosae*)

***G. maculata** (H. B. & K.) Steud. syn. *Lonchocarpus maculatus* DC.

The plant is considered poisonous to rats and other rodents but not to cattle. Powdered seeds, leaves and bark mixed with rice are used as bait for the destruction of pests. Leaves, petioles and bark are reported to possess slight insecticidal activity (*Science*, 1954, **120**, 500; *J. econ. Ent.*, 1944, **37**, 737; *Wlth India*, **IV**, 138).

Native of tropical America but grown fairly widely in parts of Madras, Mysore, Bombay and Kerala up to 1000 m.

GLORIOSA (*Liliaceae*)

G. superba Linn.

English–*Climbing lily.*

The drug is a gastro-intestinal irritant and may cause vomiting and purging. It is used for promoting labour pains and as abortifacient.

The tuber is given to cattle for the expulsion of worms. Toxic properties are due to the alk. colchicine present. Besides, the tubers contain a small amount of essen. oil. The tuber ext. shows antibiotic activity against *Staph. aureus* (*Indian J. med. Res.*, 1949, **37**, 169).

Young leaves contain chelidonic acid. The leaf juice kills lice in hair. Leaves of the Indian plant yield colchicine, dimethylcolchicine, N-formyldeacetylcolchicine and lumicolchicine and two others (*Arch. Pharm. Berl.*, 1957, **290**, 376; *Chem. Abstr.*, 1958, 655 *b*). Investigations on the constituents (*Pharmazie*, 1953, **8**, 1041; *Biol. Abstr.*, 1957, 18552).

Colchicine and related alks. also identified in the bulbs and seeds (*Planta Med.*, 1959, **7**, 298; *Chem. Abstr.*, 1960, 6011 *d*).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

GLYCINE (*Leguminosae*)

***G. hispida** Maxim.

It includes the typical cultivated forms of the plant *G. ussuriensis* Regel & Maack. The wild soyabean, *G. gracilis* Skvortzov, comprises the intermediate semi-cultivated form and *G. soja* Sieb. & Zucc. includes only the wild form.

In *G. hispida*, strepogenin level found ten times higher than what is in casein (*Indian J. Physiol. Pharmac.*, 1958, 5, 83).

Indigenous to Japan.

G. max. Merr. syn. *G. soja* Sieb. & Zucc.; *Soja max*.

English–*Soyabean, Soya, Soja, Coffee bean, Coffee berry*.

H.–*Bhat, Bhatwar, Bhetmas, Ramkurti*; B.–*Garjhalai*; Assam–*Patnijokra*; Khasi–*U. Ryambai-kutung*.

Soyabean is an important legume crop in the Far East. The leaves may be used as a substitute for coffee. Economic merits of soya leaves (*Wlth India*, **IV**, 142).

Mature bean seeds, like other pulses, contain small amounts of carotene, fair quantity of vitamin B-complex and a little of vitamin C. Germinated soyabean becomes fairly rich source of vitamin C. The presence of vitamins D, E and K has also been reported (*Sci. & Cult.*, 1945, **11**, 437). It is a good source of β-amylase, urease and lipoxidase. The last one in the form of soyaflour ext. is used as a bleaching agent for bread flour (*Indian J. med. Res.*, 1948, **36**, 361). It also contains variety of pigments—carotenoids, isoflavone glycosides, anthocyanins and chlorophyll (*J. sci. industr. Res.*, 1949, **8B**, 217; *Curr. Sci.*, 1953, **22**, 363).

A process for the preparation of soyamilk, developed at the Indian Institute of Science, Bangalore. Soyamilk is of particular value in case of milk allergy and in special diets (*Tech. Bull. cent. Fd tech. Res. Inst.*, 1951-52, **1**, 270; *Indian J. med. Res.*, 1949, **37**, 77).

GLYCOSMIS (*Rutaceae*)

***G. arborea** DC.; see **G. pentaphylla** Correa

G. pentaphylla Correa syn. **G. arborea** DC.

The plant is used in indigenous medicine for cough, rheumatism, anaemia and jaundice. The bitter leaf-juice is used in fevers, liver complaints and as vermifuge. A paste made of leaves and ginger is applied in eczema and skin affections. A decoction of roots is given for facial inflammations.

The air-dried plant material yields two furoquinoline bases, kokusaginine and skimmianine. Other alks. reported from the leaves are glycosin, arborine, glycosminine and arborinine. Arborine is the major alk. of the leaves also existing in the root-bark and stem but not in buds, flowers, green fruits and seeds (*Aust. J. sci. Res.*, 1952, **5A**, 579; *Sci. & Cult.*, 1951-52, **17**, 306; 1952-53, **18**, 505; 539, 553, 604; *J. Instn Chem. India*, 1952, **24**, 96; *Rec. bot. Surv. India*, 1941, **14**, No. 2). Arborine and arborinine isolated from the leaves in yields of 0·5% and 0·12% respectively (*J. chem. Soc.*, 1953, 3337; *J. Instn Chem. India*, 1952, **24**, 26); a new alk. glyborine, two neutral triterpenes arborinols A and B, stigmasterol and myricyl alc. isolated from the leaves (*J. sci. industr. Res.*, 1961, **20B**, 186). Three new alks., glycosamine, glycorine and glycosmicine, as also γ-fagarine and skimmianine isolated from the leaves, while β-sitosterol from the neutral fraction (*J. sci. industr. Res.*, 1962, **21B**, 49). Pharmacological action of alks. (*Pakist. J. biol. agric. Sci.*, 1957, 93). Minor alks. glycosmicine, glycorine and glycosminine, their structure (*Ann. Biochem.*, 1963, **23**, 123).

Arbinol, a new triterpene, and isoarbinol from the leaves (*Ann. Biochem.*, 1963, 668; *Chem. Abstr.*, 1964, **60**, 567*c*). Also two isomeric triterpene alcohols along with myricyl alcohol, stigmasterol and β-sitosterol (*J. Indian chem. Soc.*, 1964, **41**, 651).

GLYCYRRHIZA (*Leguminosae*)

G. glabra Linn.

Liquorice of commerce contains 2·2% of isoliquiritin, an anthoxanthin glycoside which imparts to it the yellow colour. Chinese sample contains a substance which is hydrolysed by acids to lapachol derivatives (*J. sci. industr. Res.*, 1954, **13B**, 475; *Chem. Abstr.*, 1950, 4635).

Roots contain a flavonoside, liquiritoside of low toxicity; it depresses smooth muscle action (*Ann. pharm. franc.*, 1955, **13**, 592; *Chem. Abstr.*, 1956, 6748 *h*). Liquiritigenine chalcone of spasmolytic properties is found in the plant (*Sci. pharm.*, 1957, **25**, 172; *Chem. Abstr.*, 1958, 3267 *b*). Action of glycyrrhizic acid and glycyrrhetinic acid of liquorice root resembles that of the adrenal hormones, desoxycorticosterone and hydrocortisone. Chalcone glycosides, isoliquiritin and neoisoliquiritin (*Dokl. Akad. Nauk. SSSR*, 1964, 155, 600; *Chem. Abstr.*, 1964, 14579 *c*).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Seeds are reported to possess medicinal properties (*Sci. & Cult.*, 1952-53, **18**, 362).

GMELINA (*Verbenaceae*)

G. asiatica Linn.

A glycosidic substance but no saponin is reported in the plant (*J. sci. industr. Res.*, 1952, **11B**, 26).

The unsaponifiable matter of the seed oil consists of sitosterol (*J. sci. industr. Res.*, 1949, **8B**, 49).

***G. elliptica** Sm. syn. *G. villosa* Roxb.

The plant is applied to the head to prevent loss of hair.

Leaves cathartic. They are rubbed, after boiling, on gums in toothache. Leaves and roots are applied to wounds. The juice of leaves and drupes dropped into ears for earache. An infusion of the crushed drupe is used as eye lotion (*Wlth India*, **IV**, 156).

Found in Nicobar Islands.

GNAPHALIUM (*Compositae*)

G. luteo-album Linn.

English–*Jersey cudweed, Cottonweed, Cat's foot, Everlasting flower.*

The drug is diuretic, astringent, febrifuge, haemostatic, cholagogue and vulnerary. Tomentum is applied as counter-irritant for gout. Plant gives a faint test for alks.; it contains resin, tannin, essen. oil, bitter principle and phytosterin (*Bull. sci. industr. Res. Org., Melbourne*, No. 268, 1952, 34; STEINMETZ, 526).

GNETUM (*Gnetaceae*)

G. scandens Roxb.

Seeds yield 14·2% of a fixed oil, used in Travancore for massage in rheumatism.

Roots and stems are used in Annam as antiperiodic (*Proc. Indian Acad. Sci.*, 1943, **17A**, 195).

GONYSTYLUS (*Thymelaeaceae*)

***G. macrophyllus** (Miq.) Airy Shaw

Essen. oil from the wood contains gonystylol ($C_{15}H_{26}O$). The wood is burnt as incense, the smoke from the burning oil reported to relieve asthma (*Wlth India*, **IV**, 169).

Nicobar Islands.

GOSSYPIUM (*Malvaceae*)

***G. stocksii** Mast.

Gossypol content 0·13% [*Econ. Bot.*, 1960, **14**(3), 197, 199].

Found in the limestone rocks on the coasts of Sind.

GRACILARIA (*Rhodophyceae*)

G. lichenoides (Linn.) Harv.

Agar-agar [*Indian J. Technol.*, 1962, **1**(5), 22].

GREVILLEA (*Proteaceae*)

***G. robusta** A. Cunn.

English–*Silver oak, Silky oak.*

Tam.–*Savukkumaram.*

Leaves contain quebrachitol (0·4%) and arbutin. The flowers contain β-carotene. Other xanthophyll pigments are lutein and krypto-xanthin (*Industr. Engng Chem.*, 1951, **43**, 141; *Wlth India*, **IV**, 260).

Leaves contain rutin (*J. pharm. Soc. Japan*, 1951, **71**, 1493; *Chem. Abstr.*, 1952, 4177 *a*).

Cultivated throughout India, native of Australia.

GREWIA (*Tiliaceae*)

G. populifolia Vahl

Mucilage of bark reported to have bacterial activity and also used in the treatment of tuberculosis in hilly areas. No alk. and no glucoside detected, nor did the alcoholic ext. show any antitubercular action, but it slightly increased intestinal motility (*J. sci. industr. Res.*, 1959, **18C**, 20).

GUAIACUM (*Zygophyllaceae*)

***G. officinale** Linn.

English–*Pockwood tree, Brazil wood.*

H.–*Chobehyat*; Bo.–*Loh-lakkar*; S.–*Jivdas; Lohkashi, Amritdaru, Bridhmitra.*

Gum—Guaiacum or Guaiac resin—obtained either as a natural exudation from the tree or by burning logs of wood at one end after making incisions in the middle, when the resin flows out and is collected. Quite often the wood in chips or sawdust form is boiled in brine or sea-water when the resin melts and is collected from the surface. This gum is a mild laxative and is used in the treatment of chronic rheumatism and gout. In the form of lozenges it is employed in the treatment of tonsillitis and pharyngitis with rheumatism.

Used to prevent rancidity and loss of flavour in preserved foods, is antioxidant for lard. It is used in the form of tincture for the detection of blood stains and for testing the presence of cyanogenetic glycosides.

The stem-bark yields another resin distinct from but analogous to that of the wood. It is acrid and stimulant and used in tinctures and Plummer's pills.

Native of tropical America, but cultivated in Indian gardens.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

GUAZUMA (*Sterculiaceae*)

G. tomentosa Kunth syn. *G. ulmifolia* Lam. (the two considered by some authors to be distinct though closely related species).

Fruit is used in Mauritius as a pectoral in cases of bronchitis.

Roasted seeds are considered astringent; used in stomach troubles.

Bark tonic and demulcent, the inner bark valued for elephantiasis in W. Indies. Infusion of old bark sudorific and useful in cutaneous and chest diseases.

Leaves ext. reduces corpulence (*Wlth India*, IV, 269).

GUETTARDA (*Rubiaceae*)

***G. speciosa** Linn.

Tel.–*Panniru chettu*; Tam.–*Pannir*; Kan.–*Bilihuvinalakki*; Mal.–*Ravapu*; Oriya–*Himapushpa*, Andamans–*Domdomah*.

Flowers deliciously fragrant and appear throughout the year. Ext. resembles rose water, much valued in Kerala.

Stem-bark is used in chronic dysentery in Indonesia; applied to wounds and abscesses in Indo-China (BURKILL, I, 1115).

Near seashore and in tidal forests of South India and Andamans.

GYMNEMA (*Asclepiadaceae*)

G. sylvestre R. Br.

English–*Australian cow plant*.

Leaves—exts. by ethyl acetate or by chloroform possess the property of destroying the sense of taste for sweet substances.

The leaf material stimulates insulin secretion, though it has no component having direct action on blood sugar (*Congr. Luso-espan. farm.*, 1952, **3**, 197; *Chem. Abstr.*, 1954, 11728 *c*).

Leaves used as an antidiabetic agent, their chem. investigation (*J Indian chem. Soc.*, 1958, **35**, 650). These have active principles having blood-sugar reducing properties [*Curr. med. Pract.*, 1959, **3**(5), 227; *Biol. Abstr.*, 1959, 14336]. Oral administration caused inhibition of hypoglycemic response of anterior pituitary ext. in rats (*Indian J. med. Res.*, 1964, **52**, 200).

Leaves of *G. hirsutum* W. & A. and of *G. montanum* Hook. f. occurring in Bundelkhand, Bihar and in Western Ghats from Konkan southwards respectively, also contain gymnemic acid and possess, when chewed, the property of paralysing the taste of sweet and bitter substances temporarily.

GYMNOPETALUM (*Cucurbitaceae*)

G. cochinchinense Kurz.

Bihar–*Kaubutkila*.

Fruits poisonous though edible in young stage. A decoction of the leaves taken as antidote to poisoning and also against tetanus after a miscarriage.

Leaf juice squeezed into the eyes in ophthalmia.

Roots pounded and mixed with hot water, rubbed on the body in aches and atrophy (*Wlth India*, IV, 277).

Sikkim up to 600 m.; Assam, Cachar, Bengal and Chota Nagpur.

GYROCARPUS (*Combretaceae*)

***G. americanus** Jacq. syn. *G. jacquini* Gaertn.

H.B. & G.–*Zaitun*; Tam.–*Tanakku, Kadavai, Karamanikkay, Teppam, Manuvu*; Kan.–*Kadubende pollika*; Oriya–*Pitella, Sutoroho*.

Leaves contain 0·03% of phaeanthine (*Aust. J. Chem.*, 1953, **6**, 180).

Bark contains two alks., phaeanthine (0·4-0·6%) and *d*-magnocurarine (0·6-0·7%); the latter possesses curarizing properties (*Rep. Aust. Ass. Adv. Sci.*, 1952, **29**, 67; *Chem. Abstr.*, 1954, 2329*d*; *J. sci. industr. Res.*, 1962, **21B**, 581).

Frequent in Deccan Peninsula and Malay Peninsula.

HABENARIA (*Orchidaceae*)

***H. susannae** (Linn.) R. Br. syn. *Plantathera susannae* (Linn.) Lindl.

Chota Nagpur–*Hukakanda*; Bo.–*Waghchoora*.

Tubers relished by jungle tribes. These are used as a cure for blebs or bullae, especially those occurring on the palm of the hand (*Wlth India*, V, 1).

Fairly common in Western Ghats and in Sub-Himalayan tract.

HAEMANTHUS (*Amaryllidaceae*)

***H. multiflorus** Martyn

English–*Painter's brush lily*.

Bulbs used as fish poison in Africa, also reported to be poisonous to pigs. Ext. of bulbs used as topical treatment for leprosy, ulcers, febrile colds, asthma, coughs and wounds (*J. Amer. chem. Soc.*, 1955, **77**, 1248).

Of the alks. of bulbs of several species which are poisonous, the following have been isolated: buphanine, lycorine, haemanthine, coccinine, manthidine, manthine, montanine, natalensine, tazettine and distichine. Of these montanine, natalensine and a few others have a slight hypotensive activity (*J. Amer. chem. Soc.*, 1955, **77**, 1248).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Native of Africa, but *H. multiflorus* is the best known of the genus grown in India.

HAEMATOXYLON (*Leguminosae*)

H. campechianum Linn.

English–*Logwood, Peachwood, Campeachy tree.*

The leaves contain quercetin, tannin, ellagic acid and myricetin besides ethyl gallate, which is a mycobacteria-specific antibiotic (*Wlth India*, V, 2).

HALOXYLON (*Chenopodiaceae*)

H. salicornicum Bunge ex Boiss.

Eight alks. from the stems and leaves of the plant from Cairo (*Svensk farm. Tidskr.*, 1960, **64**, 541; *Chem. Abstr.*, 1960, 23193 *b*).

HAMELIA (*Rubiaceae*)

***H. erecta** Jacq.; see **H. patens** Jacq.

***H. patens** Jacq. syn. *H. erecta* Jacq.

The plant is reported to be poisonous.

The red flowers yield a mixture of two pentose glycosides, malvidin and petunidin. A syrup of the berries is said to be useful in dysentery (*J. sci. industr. Res.*, 1955, **14B**, 211).

The genus is indigenous to America; introduced into India and grown as an ornamental plant in gardens.

HARDWICKIA (*Leguminosae*)

H. pinnata Roxb. syn. *Kingiodendron pinnatum* (Roxb.) Harms.

English–*Piney.*

H.–*Samprani.*

The oleoresin is employed in the treatment of gonorrhoea. Also reported to be used as a dressing for sores of elephants (*J. Indian Inst. Sci.*, 1919, **2**, 29).

Essen. oil from the oleoresin consists mainly of β-caryophyllene (84%); α-caryophyllene and cadinene sesquiterpene (2%) also present. The oil may be used as a substitute for imported clove oil (*J. Indian chem. Soc.*, 1948, **25**, 495; 1949, **26**, 263; *Rep. ess. Oils Schimmel*, 1949-50, 12; *J. sci. industr. Res.*, 1949, **8B**, Suppl., 156).

HARPULLIA (*Sapindaceae*)

***H. arborea** (Blanco) Radlk.; *H. cupanioides* Hiern

Tam.–*Nei-kottei*; Kan.–*Bidsale*; Mal.–*Chittila madakku*; Oriya–*Phutika.*

The fruit contains saponaceous matter. Bark used as hair wash and also as a fish poison and to prevent leech bites. Seed-oil sometimes employed as an antirheumatic (*Wlth India*, V, 9).

Found in Assam, Orissa and Western Ghats up to an alt. of 4000 ft.

HEDERA (*Araliaceae*)

H. helix Linn. syn. *H. rhombea* Sieb. & Zucc.

English–*Common Ivy, Nepal Ivy, Bentwood.*

Leaves contain hederin and saponosides (*Med. trop.*, 1949, **9**, 593; *Chem. Abstr.*, 1951, 2633 *a*); vitamins, β-carotene and α-tocopherol in the plant (*Boll. chim.-farm.*, 1958, **12**, 102; *Chem. Abstr.*, 1958, 10497 *e*).

Fatty acids from the fruit oil (*Ann. Rep. Fac. Pharm. Kanazawa Univ.*, 1954, **4**, 1; *Chem. Abstr.*, 1956, 10987 *a*).

***H. nepalensis** K. Koch

Kumaon–*Banda*; Jaunsar–*Mithiari.*

Leaves—for fomentation in glandular enlargement.

Berries—infusion used in rheumatism.

Found in Himalayan region, between 1500 and 2500 m.

***H. rhombea** Sieb. & Zucc.; see **H. helix** Linn.

HEDYCHIUM (*Zingiberaceae*)

***H. coronarium** Koenig.

English–*Common ginger lily, Garland flower.*

The plant used as a remedy for foetid nostrils in Hawaii. Ground rhizomes are employed as febrifuge by the Mundas in Ranchi. A decoction is considered antirheumatic, tonic and excitant; in Moluccas, it is used as gargle (*Wlth India*, V, 13).

Flowers yield 0·05-0·07% of a concrete with a strong spicy odour, which gives 50·0-57·8% of a thick oily absolute. By steam distilling the concrete or the absolute gives an essen. oil (yield 19%), which is valued in high grade perfumes (*Perfum. essent. Oil Rec.*, 1952, **43**, 231).

Composition of absolute and concrete from the rhizomes (*Perfum. essent. Oil Rec.*, 1952, **43**, 231). Fresh rhizomes yield essen. oil (1·7%) having carminative properties and anthelmintic indications, and contain eucalyptole (*Proc. Pacif. Sci. Congr.*, 1953, **4A**, 145; *Chem. Abstr.*, 1961, 4890; *Anais Ass. bras. Quim.*, 1959, **18**, 179; *Chem. Abstr.*, 1960, 11386 *h*).

Occurs throughout the moist parts of India up to 2000 m. alt. and commonly grown in gardens.

***H. flavum** Roxb.; see **H. coronarium** Koenig.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

HEDYOTIS (*Rubiaceae*)

*H. corymbosa (Linn.) Lam.; see **Oldenlandia corymbosa** Linn.

*H. costata Roxb. (Kurz); see **H. vestita** R. Br.

*H. fruticosa Linn.; see **Oldenlandia fruticosa** K. Schum.

*H. glabra R. Br.
A decoction of the herb used as a blood purifier. The herb employed in the preparation of poultices for headaches and stomachaches in Malaya. Mixed with a little ginger and salt it is used for incipient sores (*Wlth India*, V, 17).
Recorded in some parts of Bengal and Assam.

*H. herbacea Linn.; see **Oldenlandia herbacea** Roxb. syn. *O. heynii* R.Br.

*H. hispida Ritz.; see **Oldenlandia hispida** Benth. syn. *H. verticillata* Lam.

*H. pinifolia Wall. ex G. Don.
Plant employed in poultices for aching parts of the body in Malaya (Burkill, I, 1131).
Found in parts of Bihar and in the Andaman Islands.

*H. scandens Roxb.; see **Oldenlandia scandens** K. Schum.

H. umbellata (Linn.) Lam.; see **Oldenlandia umbellata** Linn.

*H. vestita Br. syn. *H. costata* (Roxb.) Kurz
A decoction of the root is employed as a lotion for rheumatism in Malaya.
Occurs in Sikkim and Assam up to about 2000 m.

HELIANTHUS (*Compositae*)

H. annuus Linn.
English–*Common sunflower*.
Seeds yield an oil, 22-36%, used in cooking and as salad oil. Also employed as a base in pharmaceuticals. Sometimes used as an adulterant to olive oil, but considered equal in nutritive value.
Plant contains saponin; leaves contain ascorbic, citric and malic acids and carotene. Leaf ext. antibacterial (*Wlth India*, V, 25). Trace elements in leaves (*Curr. Sci.*, 1964, 85).
Amino acid composition of the seeds (*Food Sci.*, 1959, 119).
Triterpene saponins of the plant on acid hydrolysis yield a new triterpene dihydroxy acid, named helianthic acid (*Acta biochim. polon.*, 1956, **3**, 299; *Biol. Abstr.*, 1960, 24948).

*H. tuberosus Linn.
English–*Jerusalem artichoke, Girasole, Topinambur*.
H.–*Hatichuk*; B.–*Brahmokha*; P.–*Hathipich*.
Tubers eaten raw or boiled, also pickled. Small amounts of vitamins B and C, purine bases, arginine, histidine, betain, choline and haemagglutinin are present. The carbohydrate content of tubers varies from 8 to 18%. Besides glucose and levulose, gluco-fructosans from sucrose to inulin are present. Inulin and closely related inulides are the principal carbohydrates (*Wlth India*, V, 26).
Jerusalem artichoke is a commercial source of levulose used as a sweetening agent by diabetics.
Introduced into Assam, Bengal, U.P., Bombay and Hyderabad in gardens and hill stations.

HELICIA (*Proteaceae*)

*H. robusta (Roxb.) R. Br. ex Wall. syn. *H. javanica* Blume
The fruit is poisonous. Very young shoots and leaves are eaten. The plant is used for poulticing (*Wlth India*, V, 27; Burkill, I, 1133).
Found in Assam up to about 1000 m.

HELICTERES (*Sterculiaceae*)

H. isora Linn.
English–*East-Indian screw tree*.
The drug is a demulcent and mild astringent. The bark is prescribed for diarrhoea, dysentery and biliousness. It contains chloroplast pigments, phytosterol, a hydroxy-carboxylic acid, an orange-yellow colouring matter, saponins, sugars, phlobotannins and lignin (*Bull. Res. Inst. Univ. Travancore*, 1954, 3A, 89).

HELIOTROPIUM (*Boraginaceae*)

*H. currassavicum Linn.
Roots ground to powder and applied to sores and wounds (*Econ. Bot.*, 1954, 8, 3).
Introduced from West Indies, now found along the Coromandel coast.

*H. lasiocarpum Fisch. & May.
The alks. heliotrine and lasiocarpine, which are chemically related to the alks. of *Senecio* spp. Lasiocarpine causes necrosis of the liver (Kirt. & Basu, III, 1697; *Indian J. agric. Sci.*, 1940, **10**, 33; U.S.D. 1947, 1475). Alks. of and structure of heliotrine and heliotrioline (*Chem. Abstr.*, 1950, 1113*g*, 6422 *b*).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

***H. ovalifolium** Forsk.

The plant is said to be poisonous, causing diarrhoea and vomiting. In Africa, it is applied externally to syphilitic ulcers (*Wlth India*, V, 30).

Throughout Indian plains up to 900 m.

H. tuberculosum Boiss. syn. *H. undulatum* Vahl

In North Nigeria, it is applied locally for headache and taken internally to increase lactation. The herb is given in gonorrhoea (*Wlth India*, V, 30).

HELLEBORUS (*Ranunculaceae*)

H. niger Linn.

Cardiac glycoside (hellebrin); identn. [*Arch. Pharm. Berl.*, 1956, **288**(60), 101].

HELMINTHOSTACHYS (*Ophioglossaceae*)

H. zeylanica (Linn.) Hook. syn. *H. dulcis* Kaulf.

The Malays regard the rhizome as a tonic and eat it with betel for whooping cough; it is used in Java for dysentery, catarrh and early stages of phthisis (*Bull. Org. sci. Res. Indonesia*, 1953, No. 18, 9; *Wlth India*, V, 31).

HEMEROCALLIS (*Liliaceae*)

***H. fulva** Linn.

English–*Tawny day-lily, Orange day-lily.*

Flowers are commonly used in China to flavour food. They are considered a good source of vitamin A and a fair source of thiamine and vitamin C; also reported to contain adenin (0·07 g./kg.), choline (0·25 g./kg.) and arginine (traces); presence of iodine (420 g./kg.) is also reported. The rhizomes contain asparagin (*Wlth India*, V, 32).

In China flowers are eaten to deaden all kinds of pains; they are given to women in childbirth. Ext. of the flowers is used as a blood purifier.

Occurs in the Himalayas and Khasi Hills and cultivated in gardens throughout India.

HEMIDESMUS (*Asclepiadaceae*)

H. indicus R. Br.

English–*Indian sarsaparilla.*

The dried roots are medicinal and constitute the Hemidesmus or Anantamul which is official in Indian Pharmacopoeia.

β-Sitosterol, α- and β-amyrins, lupeol, tetracyclic triterpene alcohols, resin acids, fatty acids, tannins, saponins, a glycoside and ketone are present in the roots (*J. Indian chem. Soc.*, 1955, **32**, 485).

HERACLEUM (*Umbelliferae*)

***H. cachmiricum** C.B. Clarke

The dry fruit contains 0·8% of an essen. oil (*Rep. ess. Oils, Schimmel*, 1947-48, 82; *J. sci. industr. Res.*, 1952, **11A**, 239).

N.W. Himalayas at 2000-3000 m.

***H. candicans** Wall.

Fruit—aphrodisiac and nerve tonic. It contains bergapten, a furanocoumarin and two other compds. of lactonic nature (*Indian J. Pharm.*, 1961, 303). Roots give essen. oil 0·1% (*Riechstoffe Aromen*, 1963, **13**, 325; *Chem. Abstr.*, 1964, **60**, 3943 *d*).

Himalayan regions.

***H. canescens** Lindl.

Essen. oil from dry roots from Kashmir, 0·13% (*Riechstoffe Aromen Koerperpflegemittel*, 1964, **14**, 226; *Chem. Abstr.*, 1964, **60**, 11842 *h*).

North-west Himalayas.

***H. nepalense** D. Don.

Ethereal ext. of the seeds contains four furocoumarins, viz. bergapten, a substance isomeric with it, byakangelicin and alloimperatorin (*Sci. & Cult.*, 1946-47, **12**, 504; *J. Indian chem. Soc.*, 1948, **25** 139).

From Nepal to Bhutan at 2000-4000 m.

HERITIERA (*Sterculiaceae*)

***H. littoralis** Dry.

English–*Looking-glass tree.*

Mar.–*Sundrichand, Kolland*; Tel.–*Advaibademu*; Tam.–*Chomuntri, kannadi-yilai*; Kan.–*Chandmara*; Mal.–*Mukuram, Nakam*; Andaman–*Mautda.*

The seeds are edible and are used as an adulterant for coconuts. A decoction of the seeds is given for diarrhoea and dysentery (Burkill, I, 1141).

Coastal forests of India and the Andaman Islands.

HERNANDIA (*Hernandiaceae*)

***H. ovigera** Linn.

The bark, seeds and young leaves are purgative. Seeds produce dizziness. The root is chewed as a remedy against eating poisonous crabs and fish. The juice of the bark and leaves has depilatory properties.

Seed kernels yield a fixed oil, which contains 2% of hernandion. It is reported to be used as hair-restorer and for dandruff in Philippines (*J. chem. Soc. Japan*, 1942, **63**, 1540; *Chem. Abstr.*, 1947, 2917; 1953, 10872).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Whole fruit contains 0·5% of an essen. oil (WEHMER, I, 375).

Wood from trunk yields 1-2% of an ethereal oil (*Chem. Abstr.*, 1916, 1076) and wood from the root also yields 0·5% of a similar ethereal oil.

On the shores of Andaman Islands.

HERNIARIA (*Illecebraceae*)

***H. glabra** Linn.

English–*Herniary rupture-wort.*

The plant—astringent and diuretic. Generally administered in the form of infusion in catarrhal affections of the bladder.

The aq. ext. is a hand cleanser, making the skin soft and supple (*Chem. Abstr.*, 1941, 3032).

The plant contains herniarin and a haemolytic saponin and also an essen. oil (0·58% yield) (*Wlth India*, V, 39)

Europe and North Asia, but introduced in Indian gardens.

***H. hirsuta** Linn.

A decoction of the herb used for sore throat in South Africa. The plant is diuretic. A decoction of the root given to horses suffering from bots and colds (WATT & BREYER-BRANDWIJK, 175).

Herb contains herniarin, saponins and an odoriferous toxic principle coumarin. Coumarin in large doses causes nausea, vomiting, vertigo, depression of the heart and coldness of the extremities. It is said to be powerfully narcotic and irritating to the stomach (*Wlth India*, V, 39).

Chromatograph, sepn. of saponins and identn. of their sugars (*Biul. Inst. Rosl. leczn.*, 1963, **9**, 12; *Chem. Abstr.*, 1964, 13094 *f*). Saponins and their sugars (*Biul. Inst. Rosl. leczn.*, 1963, **9**, 12; *Chem. Abstr.*, 1964, **60**, 13094 *f*).

From Kashmir to Kumaon up to 3000 m.

HESPERETHUSA (*Rutaceae*)

***H. crenulata** (Roxb.) M. Roem syn. *Limonia crenulata* Roxb., *L. acidissima* Auct. non-Linn.

H.–*Beli*; M.–*Tondsha*; Tel.–*Tor-elaga*; Tam.–*Nayvila*; Kan.–*Nayibullal*; Mal.–*Kattunarakam*; Oriya–*Bhenta*; Bo.–*Ranlimbu, Maringi*; Chota Nagpur–*Belsian*; Merwara–*Keiri, Kara.*

Fruit—bitter and occasionally used as a condiment with fish, meat, etc. Dried fruit—tonic, stomachic, used in malignant and pestilent fevers and as antidote for poisons.

Leaves and roots are medicinal.

Roots—bitter, aromatic, purgative and sudorific (*Wlth India*, V, 40).

Occurs throughout India, from Punjab and Kumaon to Bihar, Orissa, Assam, Madhya Pradesh, Bombay, Mysore and S. India at 1500 m.

HIBISCUS (*Malvaceae*)

H. abelmoschus Linn. syn. *Abelmoschus moschatus* Medic

English–*Musk mallow.*

Aromatic principles from seeds (*Indian Patent* 74,408, 1962). Seed oil contains 18·90% of linoleic acid (*Indian J. Pharm.*, 1964, **26**, 163). Flower yields flavonoids, myricetin and cannabistrin (*Curr. Sci.*, 1964, 431).

Ext. of the upper parts of the plants and fruits show insecticidal toxicity (*Wlth India*, V, 77).

H. esculentus Linn. syn. *Abelmoschus esculentus* (Linn.) Moench.

Pods are rich in pectin and mucilage and are a fair source of iron and calcium. Fresh pods are reported to contain: vitamin A 740 i.u., thiamine, riboflavin, ascorbic acid and niacin. Mucilaginous exts. of stems (*Indian J agric. Sci.*, 1949, **19**, 137). A mucilaginous preparation from the pods is used as a plasma replacement (*Chem. Abstr.*, 1951, 9805; *J. Amer. chem. Soc.*, 1954, **76**, 3544; *Wlth India*, V, 87; *J. Indian chem. Soc.*, 1962, 577).

Leaves employed as emollient poultice. An infusion of the roots is used in syphilis in Malaya. Infusion of roasted seeds has sudorific properties. Seeds stimulant, cordial, and antispasmodic (*Wlth India*, V, 88).

Whole plant is aromatic, emitting clove-like odour. Leaves and stems contain iodine (*Chem. Abstr.*, 1942, 3824). Ripe seeds contain (16-22%) of an edible oil (*J. Amer. Oil Chem. Soc.*, 1950, **27**, 295; *Indian Soap J.*, 1947-48, **13**, 990).

The flowers contain two flavonol pigments, gossypetin and quercetin (*Curr. Sci.*, 1947, **16**, 343; *Proc. Indian Acad. Sci.*, 1953, **37A**, 718).

***H. ficulneus** Linn. syn. *Abelmoschus ficulneus* Wight & Arn.

H.–*Ran bhendi*; B.–*Ban-dheras, Jungli bhindi*; Tel.–*Nelabends, Parupubenda*; Tam.–*Kattuvendai*; Punjab–*Deola, Dula, Kapasiva.*

The fruits are rich in vitamin C (38 mg./100 g.). Seeds aromatic, used for flavouring sweetmeats. Farnesol and ambrettolide are the odorous constituents of the essen. oil (*Wlth India*, V, 89).

Found from Punjab to Bengal and Southward to Deccan and S. India.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

H. mutabilis Linn.

Flavonoids of flowers (*Curr. Sci.*, 1964, 112).

H. rosa-sinensis Linn.

English–*Shoe flower, Chinese hibiscus.*

The flowers are reported to be eaten, raw or pickled in China and Philippines. They contain thiamine, riboflavin, niacin and ascorbic acid (*Philipp. J. Sci.*, 1955, **84**, 343). Crushed flowers contain an anthocyanin pigment, cyanidin diglucoside (*J. Univ. Bombay*, 1952, **21**, 47).

Flowers—demulcent, emollient, refrigerant, aphrodisiac and emmenagogue. A decoction of flowers in bronchial catarrh. Fried in ghee, given in menorrhagia.

Leaves—emollient, aperient, anodyne and laxative. A decoction of leaves is used as a lotion in fevers. Mixed with the juice of *Vernonia cinerea* Less. Used in Malaya to stimulate expulsion after childbirth.

Root—a substitute for *Althaea* root. It is demulcent and used for coughs. Its decoction is given in venereal diseases and fever, fresh root juice for gonorrhoea and powdered root for menorrhagia (*Wlth India*, V, 92).

H. sabdariffa Linn.

English–*Roselle hemp plant, Jamaica sorrel, Red sorrel, Natal sorrel, Nubiatea.*

The calyces—rich in acid and pectin and useful for jellies etc. The principal water-sol. acids are citric acid, *d*-malic acid, tartaric acid and hibiscus acid. They contain gossypetin and hibiscin chloride; the latter reported to possess antiseptic properties (*Wlth India*, V, 94).

Infusion of calyces—cooling and refreshing, aids digestion and useful in bilious conditions. It is diuretic, choleretic, intestinal antiseptic and mild laxative; for use in heart and nerve diseases, high blood pressure and calcified arteries. Though reported antiscorbutic it is ineffective against scurvy (*Chem. Abstr.*, 1936, 817, 1180; 1939, 3891, 7491; 1942, 4166; 1944, 2708).

The flowers yield a yellow dye, flavonol glycoside hibiscitrin; hibiscetin; gossypitrin and sabdaritrin (*Proc. Indian Acad. Sci.*, 1942, **15A**, 148; 1944, **19A**, 88; 1945, **22A**, 289; 1948, **27A**, 104).

***H. syriacus** Linn.

English–*Rose of sharon, Shrubby althaea.*

B.–*Swet jaba*; P.–*Gurhal*; Bihar & Orissa–*Gurhul.*

Leaves—used as substitute for tea in China and are considered stomachic.

Flower decoction—diuretic and is used for itch and other skin diseases in Malaya. Given for dysentery in Indo-China.

Bark and root—mucilaginous, demulcent and antifebrile; used in diarrhoea, dysentery and dysmenorrhoea.

Seeds—used in headache and colds; mixed with pig marrow and applied on ulcers (*Wlth India*, V, 97).

Indigenous to China; cultivated in gardens throughout India.

H. tiliaceus Linn.

English–*Coast cotton tree, Yellow mallow tree.*

Leaves infusion—a lotion for ulcers and wounds. Leaves—laxative and resolvent. Flowers—boiled in milk, a remedy for earache. Bark—emetic; the mucilage, obtained by macerating fresh bark in water is given in dysentery. Roots—febrifuge, aperitive, emollient, sudorific, diuretic and laxative; used in the preparation of an embrocation for rheumatism and lumbago. Seed infusion—used as an emetic in Brazil (*Wlth India*, V, 97).

H. trionum Linn.

English–*Trailing hollyhock, Black-eyed susan.*

Plant—used for roundworms in southern Africa and is reported to be poisonous to stock, particularly horses.

Dried leaves—stomachic in China and Malaya. An infusion of flowers for itch and painful skin diseases; diuretic (*Wlth India*, V, 98).

H. vitifolius Linn.

The petals are rich in flavonols with high tinctorial properties (*Bull. imp. Inst., Lond.*, 1947, **45**, 126; *Proc. Indian Acad. Sci.*, 1946, **29A**, 352). Seeds possess powerful urease activity (*Indian J. Pharm.*, 1964, **26**, 79).

HIERACIUM (*Compositae*)

***H. umbellatum** Linn.

The herb contains phytosterol (Wehmer, II, 1269).

Found from Kashmir to Garhwal at 1500-3000 m.

***H. vulgatum** (Fr.) Almq.

The herb contains inulin.

Found from Kashmir to Garhwal at 1500-3000 m.

HIEROCHLOE (*Gramineae*)

***H. laxa** R. Br.

The sweet-scented grass emits during drying a perfume like that of *Anthoxanthum odoratum* Linn.

***H. odorata** (Linn.) Beauv syn. *H. borealis* Roem. & Schult.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The plant is reported to be used in liqueur industry and fumigating powders. Its rhizomes contain a coumarin.

Found in Western Himalayas from Kashmir to Kumaon at 3000-5000 m.

HIPPOMANE (*Euphorbiaceae*)

H. mancinella Linn.

English–*Mancinell, Manchineel.*

The milky juice is exceedingly poisonous, irritant and vesicant when applied to the skin. It was supposed that even the shade of tree was poisonous. The juice causes blindness for some days if it gets into the eyes. The smoke from the wood is also injurious to the eyes. A dose of 20 drops of the latex causes fatal gastro-enteritis. Small doses (2 drops), however, act as a powerful cathartic and are administered as a vermifuge for children in Guiana and against tetanus infection in Cuba (*Wlth India*, **V**, 100). The dried bark is used in homoeopathy and possesses diuretic, emetic, cathartic and antisyphilitic properties (STEINMETZ, 563). The fruit contains a toxic principle (*J. Amer. pharm. Ass.*, 1955, **44**, 361).

HIPPOPHAE (*Elaeagnaceae*)

H. rhamnoides Linn.

English–*Seabuckthorn, Sand-thorn.*

The fruit is acidic and made into jelly with sugar. A syrup prepared from the fruit is given in lung complaints and a decoction for cutaneous eruptions.

The fruit is a rich source of vitamin C (ascorbic acid and dehydroascorbic acid). Berries give 80 mg. vit. C in one cup of tea, which is mostly destroyed on 30 min. standing (*Chem. Abstr.*, 1952, 4734). Fairly stable food products have been prepared from the fruit. The juice powder keeps its vitamin potency for 2½ years (*Chem. Abstr.*, 1945, 2585; 1949, 5510; *Hort. Abstr.*, 1949, 320). The mature fruit is rich in carotene; also contains vitamin B_1 (*Chem. Abstr.*, 1949, 3143; 1950, 617, 11032). The fruit yields a dark-red fatty oil (2% yield) of pleasant odour and taste. The centrifuged oil is a concentrated source of carotene (*Chem. Abstr.*, 1950, 11032).

The seeds contain a yellow, slow-drying oil (12·13%). They also contain two pigments, zeaxanthin and carotene (*Chem. Abstr.*, 1930, 4413; 1950, 11032).

The bark contains a yellow fatty oil (3·06%), two alks. and carotene (*Chem. Abstr.*, 1930, 4413; 1951, 8090).

The twigs and leaves contain 4-5% of tannin. The leaves contain carotene, ascorbic acid and dehydroascorbic acid. Presence of hemnin is reported in the root nodules (*Chem. Abstr.*, 1951, 8090; 1952, 11335; 1953, 12538).

HOLARRHENA (*Apocynaceae*)

H. antidysenterica (Linn.) Wall.

English–*Conessi tree, Tellicherry tree, Kurchee tree.*

The bark has astringent, antidysenteric, anthelmintic, stomachic, febrifugal and tonic properties. It is used in the treatment of amoebic dysentery and diarrhoea. Although slow in action as compared with emetine, it is less toxic. It is a substitute for emetine in amoebic dysentery (*J. pharm. Ass. Thailand*, 1950, **3**, No. 6; *Sci. & Cult.*, 1951-52, **17**, 421).

Conessine, the principal alk, possesses antitubercular activity *in situ*. It increases coronary outflow in the rabbit heart, induces narcosis in frog and produces local anaesthesia in guinea-pigs, but causes necrosis on subcutaneous injections (*J. Pharm., Lond.*, 1949, **1**, 340; *Wlth India*, **V**, 105).

Kurchi alks. are partly thermostable (43%) and partly thermolabile (57%) (*Indian J. Pharm.*, 1951, **13**, 64). Seasonal variation of alkaloidal contents in the bark (*Indian J. Pharm.*, 1957, **19**, 131); modified methods of their isolation (*J. Instn Chem. India*, 1957, **29**, 206). Their structural correlation with paravallarines (*Indian J. Chem.*, 1964, **2**, 41).

HOLBOELLIA (*Lardizabalaceae*) (*Berberideae*)

***H. latifolia** Wall.

Nepal–*Bagul*; Kumaon–*Gophla, Gophal*; Khasi–*Soh-lygn-kait, Mi-rangk'sa.*

The pulp of its fruit is mealy and insipid. Separation of hederogenin; one fraction foaming, hemolytic and toxic to fish (*Helv. chim. acta*, 1953, **36**, 1410; *Chem. Abstr.*, 1954, 1629 *i*).

Occurs in the Himalayas, from Kumaon to Sikkim, Bhutan, Assam Khasi and Jaintia Hills and Manipur at 1200-3000 m.

HOLOPTELEA (*Ulmaceae*)

H. integrifolia Planch.

English–*Indian elm.*

Fatty oil, 37·4% yield in seeds (53·2% in dry kernels) (*J. sci. industr. Res.*, 1952, **11B**, 477; 1954, **13B**, 222).

HOLOSTEMMA (*Asclepiadaceae*)

H. annularis K. Schum.

Tubers contain moisture 10·08, protein 4·07, sugar 24·0, starch 35·4

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and ash 3·07%. The pharmacological property can be attributed to the presence of the unknown sugar (*Bull. Res. Inst. Univ. Travancore*, 1951, 2A, 27).

121536

HOMALOMENA (*Araceae*)

H. aromatica Schott

The large rhizomes, bearing withered leaf scales and white rootlets valued as aromatic stimulant; and the whole plant is used in skin diseases. The rhizome on steam distillation yields about 5% of an essen. oil, an important perfumery ingredient (*Indian Tr. J.*, 1953, **185**, 268; *Indian med. Gaz.*, 1942, **77**, 210).

H. rubescens Kunth syn. *Calla rubescens* Roxb.

The rhizomes and roots on steam distillation give 5% of a sweet-smelling oil containing free alcoholic content (expressed as linalool) 75·3%, consisting mainly of *l*-linalool 60% with traces of α-terpineol and linalyl acetate (*Soap Perfum. Cosmet.*, 1952, **25**, 1953; *Bull. Soc. chim. Fr.*, 1953, 841; *Chem. Abstr.*, 1953, 6095, 12766).

HORDEUM (*Gramineae*)

H. vulgare Linn.

Barley malt is obtained by the processing of germinated grains of barley and the malt is mostly utilized for the manufacture of beer and whiskey. Other uses of malt include pharmaceutical preparations, malted milk concentrates, infant foods, barley products and candies (*Wlth India*, V, 130).

HORSFIELDIA (*Myristicaceae*)

***H. irya** (Gaertn.) Warb. syn. *Myristica irya* Gaertn.

Andamans–*Chooglum, Mutwinda.*

Bark—decoction is used by the Malas as a gargle for sore throat. Seeds contain an oleoresin (42%). Flowers are used for perfume (BURKILL, I,1198).

In Andaman Islands in damp localities.

***H. kingii** (Hook. f.) Warb. syn. *Myristica kingii* Hook. f.

Assam–*Amol*; Lushai–*Siltui*; Garo–*Bolong*; Nepal–*Runchepot, Ramguwa*; Lepcha–*Kaoul-Kung, Donglukung.*

Fruit edible and causes intoxication. Seeds are substitute for arecanut. Bark yields a red juice on incision, which is dried and used as a substitute for Malabar kino (*Pterocarpus marsupium*); it contains 30·2% tannin; useful for mouthwash (*Wlth India*, V, 132).

Found in Sikkim Himalayas up to 1200 m., in Assam (except Khasi Hills) and in northern Bengal.

HOUTTUYNIA (*Saururaceae*)

***H. cordata** Thunb.

Rhizomes are reported to be used in medicinal preparations for certain diseases of women.

Entire plant is considered cooling, resolvent and emmenagogue in Indo-China. Considered useful for indigestion in China; applied as a plaster on injured parts to promote bone growth. Leaves are given for measles, dysentery, and gonorrhoea and used in the treatment of eye troubles, skin diseases and hemorrhoids (*Wlth India*, V, 132).

Root ext.—diuretic, attributable to the presence of quercitrin and inorganic salts like potassium chloride and potassium sulphate (*J. pharm. Soc. Japan*, 1942; **63**, 105; *Chem. Abstr.*, 1950, 11030).

Rhizomes yield a sterol, resembling sitosterol, which stimulates the secretion of antibiotic substances from a Gram-positive spore-forming bacillus (*Tohuku J. exp. Med.*, 1950, **52**, 265; *Chem. Abstr.*, 1951, 5759).

An active principle, effective in the treatment of stomach ulcers, has been extracted [*Japan Patent* 880 (50); *Chem. Abstr.*, 1952, 7716].

The plant on steam-distillation yields an essen. oil with a strong, somewhat disagreeable odour (*J. Soc. chem. Ind., Lond.*, 1921, **40A**, 560).

Subtropical Himalayas from Punjab to Sikkim and also in Assam, Khasi Hills and Manipur up to about 2000 m.

HOVENIA (*Rhamnaceae*)

***H. dulcis** Thunb.

English–*Japanese raisin tree, The Coral tree.*

H.–*Sicka*; P.–*Chamhun*; Assam–*Chetia-bola*; Nepal–*Bangikath*; Lepcha–*Sungree-kung.*

Peduncles—sweet and fleshy, esteemed in China and Japan as edible; sweetness due to glucose (11·14%), fructose (4·74%) and sucrose (12·59%). Fruit—diuretic, contains potassium nitrate and potassium malate.

In China, dried peduncles are used medicinally and seeds for relieving intoxication due to wine (*Wlth India*, V, 133).

Sub-Himalayan tract from Chamba to Bhutan up to 2000 m. and in North Bengal, Assam and Khasi and Garo Hills.

Digitized by Arya Samaj Foundation Chennai and eGangotri

HOYA (*Asclepiadaceae*)

***H. carnosa** R. Br.
English-*Common wax plant.*
Stems and leaves contain a sterol glucoside, hoyin (0·76-0·832%) (*Chem. Abstr.*, 1939, 807).
Grown in Indian gardens.

***H. multiflora** Blume.
Juice of the plant, diuretic; pounded leaves are used in Java in rheumatism (BURKILL, I, 1202).
Recorded from Naga Hills in Assam.

***H. pendula** Wight, non Wight & Arn. =*H. iconum* Santapau
The plant is emetic and alexipharmic (*Wlth India*, V, 134).
Greater part of the Deccan Peninsula.

HUMULUS (*Cannabinaceae*)

H. lupulus Linn.
English–*Common hop.*
Resinous bodies of hops, α- and β-resins and their active constituents, humulone and lupulone which are highly bacteriostatic against Gram-positive and acid-fast bacteria (*Wlth India*, V, 136; *J. Amer. chem. Soc.*, 1955, **77**, 2828; *Chem. & Ind.*, 1953, 436).
Average yield of essen. oil of hops is 0·4-0·5%. It is mainly used for flavouring beer and other beverages (*Wlth India*, V, 137). Lupulin glands impart the commercial value to hops (U.S.D., 1955, 1744).
Flowers of male hops, the variability of morphological and chemical characteristics [*Diss. Abstr.*, 1961, **22**(4), 978; *Biol. Abstr.*, 1962, 7264].

HUNTERIA (*Apocynaceae*)

H. legocii Livera. syn. *H. corymbosa* Roxb.
Reaction of corymine, an alk. isolated from the leaves (*Proc. chem. Soc., Lond.*, 1962, 298; *Chem. Abstr.*, 1963, **58**, 3471*h*).

HURA (*Euphorbiaceae*)

H. crepitans Linn.
English–*Sandbox tree, Monkey dinner-bell.*
The seeds, the fresh latex and decoction of the bark possess emeto-cathartic properties; violently poisonous in large doses.
Latex, bark and seeds employed in treatment of leprosy. The guiana leaves used for chronic pains (*Wlth India*, V, 138).
Latex—acrid, produces erysipelatous redness and pustular eruptions on contact with the skin; causes blindness if it gets into the eyes; used as a fish poison and arrow-poison. In Brazil employed for elephantiasis. The latex contains hurin, a compd. related to cardol, and a proteolytic enzyme, hurain (U.S.D., 1955, 1714).
All parts of the plant especially fruits and seeds show insecticidal properties (*J. econ. Ent.*, 1949, **42**, 549).

HYDNOCARPUS (*Flacourtiaceae*)

H. alpina Wight
Seeds contain up to 62·5% of a fatty oil, the chief component acids of which are chaulmoogric and hydnocarpic (HILDITCH, 1956, 221). The oil possesses marked therapeutic value, especially in the treatment of leprosy.

H. laurifolia (Dennst.) Sleumer
Seeds constitute the source of hydnocarpus oil, which is by far the most important oil of the chaulmoogra group; the oil is considered to be therapeutically superior to chaulmoogra oil (*Wlth India*, V, 142).
Ethyl hydnocarpate possesses the therapeutic properties of the oil and is generally preferred to the latter in the treatment of leprosy. A number of preparations of ethyl esters such as Moogrol, Chaulmestrol and Antileprol are available (*Wlth India*, V, 142).
In culture media, various hydnocarpates have checked the growth of acid-fast *Mycobacterium laprae*. The oil is active against acid-fast bacteria. Sodium salts of chaulmoogric and hydnocarpic acids in 1 : 100,000 dilution are reported to be bactericidal against *M. tuberculosis*. But the mode of action of chaulmoogra in leprosy is still uncertain (U.S.D., 1955, 658).

HYDNOPHYTUM (*Rubiaceae*)

***H. andamanense** Becc. syn. *H. formicarium* Hook. f.
The tubers are used in the form of a decoction for liver and intestinal complaints; also used in poultices for headaches (*Wlth India*, V, 144).
Found in Andaman Islands.

HYDRANGEA (*Saxifragaceae*)

***H. macrophylla** (Thunb.) Ser. syn. *H. hortensis* Sm., *H. hortensia* DC.
China–*Chang Shah.*
Leaves and roots are used in China as an antimalarial drug. They are more potent than quinine due to presence of an alk. $C_{16}H_{19}O_3N_2$, 2HCl. The flowers contain hydrangenol, hydrangeic acid and rutin (*Indian med. Gaz.*, 1952, **87**, 330; *Wlth India*, V, 145).
Native of Japan and China and cultivated in the hill stations in India as an ornamental.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

***H. paniculata** var. **grandiflora** Sieb.

Blossoms contain rutin (up to 4·06%), useful for reducing incidence of recurrent haemorrhages associated with increased capillary fragility, particularly in hypertension (*J. Amer. chem. Soc.*, 1945, 67, 1419).

Flowers contain 2·5% of a phenolic compd.

Roots yield a glycoside, pseudohydrangin or parahydrangin. Inner bark contains a glucoside, neohydrangin and a mucilage (*Wlth India*, V, 145).

Native of Japan and China, thriving only in hill stations in India.

HYDROCHARIS (*Hydrocharitaceae*)

***H. dubia** (Blume) Backer syn. *H. morsus-ranae* Hook. f. (Fl. Br. Ind.) non Linn.

English–*Frogbits*.

The leaves are mucilaginous and astringent (*Wlth India*, V, 146).

Floating herb occurring in ponds and ditches in Kashmir.

HYDROCOTYLE (*Umbelliferae*)

H. javanica Thunb.

It is a cooling tonic, alterative and diuretic; used as a stimulant for cutaneous diseases.

Leaves used as blood purifier, for indigestion, nervousness and dysentery. Leaf stalks useful in toothache.

The plant is reported as insecticidal; also used as a plaster for dog bite in China (*Wlth India*, V, 146).

Himalayas from Kashmir to Bhutan and Khasia Hills at 600 to 2000 m., also on mountains of Western Ghats, Nilgiris and Palnis.

H. rotundifolia Roxb. syn. *H. sibthorpioides* Lam.

The plant is used in rheumatism, pulmonary and digestive troubles, syphilis, skin diseases and as vermifuge and diuretic. The juice is reported to be emetic. In Lakhimpur (Assam) the leaves are applied to boils for suppuration. In China, the leaves are chewed in liver complaints (*Wlth India*, V, 147).

HYGROPHILA (*Acanthaceae*)

***H. salicifolia** Nees syn. *H. angustifolia* auct., non R. Br.

Bihar–*Matham arak, Tonga agia, Loyongtonta ara*.

Leaves are strongly diuretic, contain 18% ash, rich in potassium. These are used in Malaya for poulticing swellings (*Wlth India*, V, 148).

Seeds used in Java in poultices for headaches and fevers. They yield 25% of a fatty oil and traces of a bitter alk. (*Chem. Abstr.*, 1918, 2656).

Another species, *H. phlomoides* Nees, is found in the south-eastern parts of India, leaves of which are used in poultices for boils and headache (Burkill, I, 1213).

Common in moist and marshy places throughout the greater part of India.

HYMENANTHERUM (*Compositae*)

***H. tenuifolium** Coss.

Essen. oil 0·12%, hymentharene from the oil (*J. Indian chem. Soc.*, 1952, 29, 23).

Native of Chili and Mexico; grown in Bangalore.

HYMENOCALLIS (*Amaryllidaceae*)

***H. littoralis** (Jacq.) Salisb.

English–*Spider lily*.

The bulbs are used as a vulnerary in the Philippines. They contain 0·0015% lycorine and 0·03% tazettine (*J. Amer. chem. Soc.*, 1954, 76, 5815).

Native of America; grown in Indian gardens.

HYMENODICTYON (*Rubiaceae*)

***H. obovatum** Wall.

M.–*Kadwa-sirid, Karwai*; Tam.–*Yella mala kai, Ilaimergay*; Kan.–*Bogi, Hiremara, Gandele*.

The inner bark is bitter and astringent and is used as a substitute for quinine (*Wlth India*, V, 151).

Distributed in the monsoon forests of the Western Ghats.

HYOSCYAMUS (*Solanaceae*)

H. muticus Linn.

It yields hyoscine (0·02%), hyoscyamine and atropine, etc. (*J. sci. industr. Res.*, 1954, 13B, 221).

H. niger Linn.

Alks. estimation by International Pharmacopoeia and the French Pharmacopoeia methods (*Ann. pharm. franc.*, 1956, 14, 537; *Chem. Abstr.*, 1957, 6951 *i*).

Cultivation, influence of fertilizers, NPK.; Ca gives the greatest leaf crop and the highest alkaloidal content (0·06%), while PK dressings are unfavourable (alk. 0·039%).

***H. pusillus** Linn.

The herb is reported to be poisonous (*Indian J. agric. Sci.*, 1940, 34).

Occurs in Ladakh.

HYPECOUM (*Papaveraceae*)

***H. leptocarpum** Hook. f. & Thoms.

Protopine, an opium alk. isolated from this plant, has narcotic action,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

slows the heart and lowers the blood pressure in small doses (*Wlth India*, V, 154).

Found in Sikkim at 3500-4000 m.

H. procumbens Linn.

Alks. of the dried plant and of *H. leptocarpum*: protopine (0·174 and 0·328), α-allocryptone (0·009 and nil); sanguinarine (0·006 and traces), chelirubine (traces), chelerythrine (traces), coptisine (traces), amorphous non-phenolic bases (0·032 and 0·030) and amorphous phenolic bases (0·012 and 0·011%) respectively (*Colln Czech. chem. Commun. Engl. Edn*, 1961, **26**, 1472; *Chem. Abstr.*, 1961, 27782*b*).

HYPERICUM (*Hypericaceae*)

H. japonicum Thunb.

The plant is used in asthma and dysentery and as styptic in Madagascar. It is suspected to be causing photosensitization. Feeding trials in New Zealand show that it is non-poisonous (*Bull. Dep. sci. industr. Res., N.Z.*, No. 99, 1951, 45).

H. perforatum Linn.

English–*Common St. John's Wort.*

An oil known as St. John's Wort Oil (Oleum Hyperici) prepared by infusing the fresh flowers in olive oil is used externally for wounds, sores, ulcers, swellings and sometimes against rheumatism and lumbago; also valued as a sunburn oil and as a cosmetic application to the skin (*Perfum. essent. Oil Rec.*, 1953, 29). An ointment from the aq. ext. of the plant is used as hair restorer (*Chem. Abstr.*, 1954, 1637).

The principal constituents of the plant: volatile oil (yield 0·06-0·11%) shows red fluorescence with a green tinge, and contains tannins, a resin and a pigment hypericin (yield 0·466%). It also contains rutin, glucosides, alks., a fixed oil, vitamin C, provitamin A and the pigments pseudohypericin, hyperin, carotenoids, chlorophyll and a brown red pigment (*Wlth India*, V, 156).

Aq. ext. of the plant inhibits the growth of *Mycobacterium tuberculosis* and acetone ext. of ripe capsules active against *Staph. aureus* (*Chem. Abstr.*, 1954, 13800; 1955, 8389; *Antibiotics Chemother.*, 1954, 518). Novoimanin, an antibiotic preparation (*Dopov. Akad. Nauk URSR*, 1963, 1248; *Chem. Abstr.*, 1964, **60**, 5281*g*).

Pharmacochemical evaluation of 'herba hyperici' (*Farmacia, Buc.*, 1956, **25**, 327; *Chem. Abstr.*, 1957, 8370 *d*); hypericin, rutin, quercetin and chlorophyll determination (*Cslka Farm.*, 1958, **7**, 381; *Chem. Abstr.*, 1959, 7570 *e*); rutin in leaves 2%, in flowers 0·095% and leucocyanidin in leaves, stalks, buds and flowers (*Dissnes pharm., Warsz.*, 1961, **13**, 73; *Chem. Abstr.*, 1961, 15841 *d*); hypericin in plant 0·130-0·308% and in flowers 1·80-0·48%, determined photocolorimetrically, not affected by storage (*Farmacia, Buc.*, 1961, **9**, 227; *Chem. Abstr.*, 1962, 6091 *a*). Contains flavonoids: rutin, hyperoside, quercitrin, quercetin and probably isoquercetin [*Acta pharm. jugosl.*, 1959, **9**(3), 113; *Biol. Abstr.*, 1960, 39210]. Flowers contain 0·1% quercetin; and leaves 2% rutin (app.) [*Dissnes pharm., Warsz.*, 1961, **13**(1), 73, 81; *Biol. Abstr.*, 1961, 57955, 57956]. Extn. of hyperin and quercetin [*Med. Prom. SSSR*, 1964, **18**(3), 41; *Chem. Abstr.*, 1964, **61**, 8130 *d*].

Tannin contents in stems 3·8%, leaves 12·4% and flowers 16·2% (*Sci. pharm.*, 1953, **21**, 279; *Chem. Abstr.*, 1955, 9231 *b*).

Ext. of blossoms, leaves, stalks and capsules in 0·8% saline solution and in alcohol are antibacterial. The physiological effect of the drug is due to the volatile oil, hypericin, choline, tannins and nicotinic acid (*Ziva*, 1959, **6**, 208; *Chem. Abstr.*, 1960, 3849 *h*).

HYPOXIS (*Amaryllidaceae*)

***H. aurea** Lour.

Bihar–*Bhuin khajur, Dinda kinda, Kita bo.*

The root-stock is mucilaginous. It contains small grains of starch and plenty of raphides.

The plant is used as tonic and aphrodisiac in China and Malaya. Among the Munda tribes the crushed root is taken for emaciation and yellowing of eyes (Burkill, I, 1219; *Wlth India*, V, 158).

Found in the hilly parts throughout India.

HYPTIS (*Labiatae*)

***H. brevipes** Poit.

The leaves are used in poultices for headache in Philippines; they are applied on the abdomen of children against worms in Java. A decoction of stems and leaves is given after childbirth in Malaya. The plant is reported to be beneficial for bites, stabs and other wounds (*Wlth India*, V, 158).

Recorded from Andaman Islands.

***H. capitata** Jacq.

The plant is considered tonic, stimulant and excitant. In Philippines, a decoction of the roots is used for amenorrhoea, that of leaves is used for cleaning wounds.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The leaves contain a flavonol glucoside $C_{27}H_{30}O_{15}4H_2O$ which on hydrolysis gives kaempferol, glucose and rhamnose. The roots, stems and leaves are cyanogenetic (*Wlth India*, V, 158).

Found in Bengal.

H. suaveolens Poit.

The plant is considered to be stimulant, carminative, sudorific and lactagogue. Its infusion is used in catarrhal condition, affections of the uterus and parasitical cutaneous diseases. The Mundas use it for headache and as snuff to stop bleeding of the nose.

The leaf juice is taken in cases of colic and stomachaches. The leaves and tops are considered in the Philippines to be antispasmodic and used in anti-rheumatic and antisuporific baths.

A decoction of the roots is valued as an appetizer. The root is chewed with betal-nuts as a stomachic.

Plant yields essen. oil containing *l*-sabinene, *d*-limonene and azulenic sesquiterpenes (*J. Indian chem. Soc.*, 1952, 183).

Anti-A haemagglutinin from seeds (*Nature, Lond.*, 1959, **184**, No. 4680, 109).

HYSSOPUS (*Labiatae*)

H. officinalis Linn.

The leaves and flowering tops have an agreeable odour and a pungent taste; contain an essen. oil, hyssop oil (*J. sci. industr. Res.*, 1949, **8B**, 14; SONDERDRUCK 1963). Essen. oil, yield of 1-1·5, 0·8 and 0·5% in blue, red and white varieties of the herb, mainly contains *l*-pinocamphene and pinene; exts. of stalks and leaves have no antibacterial activity (*Ziva*, 1959, **7**, 210; *Chem. Abstr.*, 1960,3849 *i*); yield 1·05% (*Riechstoffe Aromen*, 1963, **13**, 33; *Chem. Abstr.*, 1963, **58**, 12365 *h*).

IBERIS (*Cruciferae*)

***I. amara** Linn. syn. *I. coronaria* Hort.
English–*Rocket candytuft.*

The plant is reported to be employed in rheumatism and gout; and used in homoeopathic tinctures. The seeds used in asthma and bronchitis; contain a mustard oil glycoside, glucoiberin (*Chem. Abstr.*, 1956, 11249 *h*).

Commonly cultivated in Indian gardens for their elegant masses of flowers. It is reported to occur in Chamba at, 1000-3000 m. probably as an escape.

ILEX (*Aquifoliaceae*)

I. aquifolium Linn.
English–*English holly, Common holly.*

Leaves give two heterosides, one a saponin (hemolytic effect) and the other an amorphous powder (*Med trop.*, 1945, 5, 324; *Chem. Abstr.*, 1951, 7307 *g*).

Leaves also contain a crystalline yellow colouring matter, ilixanthin, ilexic (ilicic) acid, ilicin, caffeic acid, dextrose, calcium malate, a resin and sterol (*Chem. Abstr.*, 1954, 3474; WEHMER, II, 718).

I. paraguariensis St. Hil. syn. *I. paraguayensis* Hook.

Leaves contain alks., caffeine, theobromine, theophylline (*Bol. Inst. nac. Tech., Rio de J.*, 1956, **7**, No. 15, 3; *Chem. Abstr.*, 1958, 17613 *b*).

ILLICIUM (*Magnoliaceae*)

I. anisatum Linn. syn. *I. religiosum* Sieb. & Zucc.
English–*Poisonous evergreen tree.*

Leaves and seeds are antibacterial (*Shikoku Acta med.*, 1951, **2**, 111; *Chem. Abstr.*, 1952, 6331 *d*); the active principle (yield of 96 mg.%) has pharmacological action similar to that of picrotoxin (*Folia Pharm. jap.*, 1952, **48**, 4; *Chem. Abstr.*, 1953, 5072 *d*).

I. griffithii Hook. f. & Thom.

The fruit aromatic, with bitter and astringent taste, reported poisonous, yields on distillation an essen. oil resembling that from aniseed (*Pimpinella anisum* Linn.) and fennel (*Foeniculum vulgare* Mill.) (*J. sci. industr. Res.*, 1947, **6B**, Suppl. 10).

ILLIGERA (*Hernandiaceae*)

***I. appendiculata** Blume syn. *I. coryzadenia* Meissn.

The leaves of this scandent shrub are reported to be used as poultice for boils in Penang (BURKILL, II, 1226).

Occurs in Khasi Hills and in the Andaman Islands.

***I. villosa** C. B. Clarke

The climber is reported to be used as a febrifuge (Fl. Assam, IV, 105).

Occurs in the hills of Assam.

IMPATIENS (*Balsaminaceae*)

I. balsamina Linn.
English–*Garden balsam.*

Seeds contain 27·0% of a viscous oil. The presence of β-amyrin, α-spinasterol and balsaminasterol has been reported in the unsaponifiable matter (*Sci. & Cult.*, 1955-56, 616).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Flowers and their alcoholic ext. possess marked antibiotic activity against some pathogenic fungi and bacteria; the active principle identified as 2-methoxy-1-, 4-naphthoquinone (*J. biol. Chem.*, 1948, 335). Deep red flowers contain a monoglycosidic anthocyanin based on pelargonidin, whereas the roots and stems contain cyanidin monoglycoside (*J. sci. industr. Res.*, 1955, **14B**, 211).

INDIGOFERA (*Leguminosae*)

I. enneaphylla Linn.

English–*Birdsville indigo.*

Poisonous properties of the plant with symptoms and control of Birdsville disease [*J. Agric. West. Aust.*, 1954, **3**(5), 597; *Biol. Abstr.*, 1959, 19312].

***I. hirsuta** Linn.

English–*Hairy indigo.*

The plant has been reported to be toxic in some cases to cattle. A decoction of the leaves is employed as a lotion for yaws in Ghana and for diarrhoea and as stomachic in Philippines.

Found throughout India up to 1500 m.

***I. suffruticosa** Mill. syn. *I. anil* Linn. var. *polyphylla* DC.

English–*W. Indian indigo, Anil indigo.*

H.–*Vilati nil*; Tam.–*Shimaiyaviri*; Tel.–*Shimanili.*

The plant is considered febrifugal, vulnerary, purgative, antispasmodic, diuretic and stomachic; it is given in syphilis and epilepsy. Decoction of leaves is sudorific, while that of roots and seeds is used for destroying vermin on human body and for urinary diseases and ulcers (*Wlth India*, V, 182).

A native of tropical America and West Indies, and introduced into India and south-east Asian countries.

INULA (*Compositae*)

***I. grandiflora** Willd.

Roots—aromatic and used as adulterant of Kuth (*Sausurea lappa*) in Kashmir and Lahoul.

Found from Kashmir to Nepal at 1800-3500 m. alt.

I. helenium Linn.

Roots contain inulin (44%), pseudoinulin, inulenin, and synanthrin, the medicinal action due to the essen. oil in roots (*Vest. Akad. Nauk. kazakh. SSR*, 1948, 5, No. 3, 59; *Chem. Abstr.*, 1952, 2240 *f*). Roots yield an oil, a mixture of aliphatic hydrocarbon, a sesquiterpene hydrocarbon (β-elemene), a triterpene ketone (friedeline) and two alcohols, dammaradienol and stigmasterol [*Bull. Soc. chim. Fr.*, 1957, **11**(12), 1359; *Biol. Abstr.*, 1958, 24694].

I. racemosa Hook. f.

Roots from plants growing in Jammu and Kashmir State contain an essen. oil; its chem. compn. (*J. sci. industr. Res.*, 1959, **18B**, 351).

I. royleana DC.

Isolation of inulin, an alk. (*Proc. Indian Sci. Congr.*, 1957, 124). From the perchlorate of the base is obtained roylene and an acid, that gives an anilide and a *p*-toluidide (*J. sci. industr. Res.*, 1959, **18B**, 534). Alks. of the roots: inuline, royline and lycotonine (*Canad. J. Chem.*, 1959, **37**, 1187). Diterpene alks., inuline and methyl lycaconitine and royline from the roots (*J. Indian chem. Soc.*, 1959, **36**, 437).

The amorphous base has marked depressant effect on respiratory system, possesses curariform activity (*Indian J. Pharm.*, 1958, 211).

IPHIGENIA (*Liliaceae*)

***I. indica** Kunth

Tam.–*Nirpanai*; Santal–*Chutiachandbol.*

The corms are used for colic and headache in parts of Bihar.

Found throughout India up to 2000 m. alt. in the Himalayas.

IPOMOEA (*Convolvulaceae*)

I. batatas (Linn.) Lam.

Root is laxative. Tops and tender shoots are used in poultices and leaves as a maturative cataplasm. The leaves are ground with salt and applied to whitlows. A paste of roots or leaves is applied to scorpion bites.

Vines and tubers contain fungicidal and bactericidal substances, a crystalline solid, active against Gram-negative *Esch. coli* and a liquid effective against Gram-positive bacteria and fungi (*Yearb. Agric., U.S. Dep. Agric.*, 1950-51, 727; *Wlth India*, V, 247).

***I. cairica** (Linn.) Sweet syn. *I. palmata* Forsk.

English–*Railway creeper.*

Tuberous roots and stems, though bitter, used as food in Hawaii. Roots and leaves slightly cyanogenetic, while crushed leaves applied on body rashes.

Seeds purgative; a pale yellow glucoside comp. 'muricatin A' from seeds possessing marked purgative activity. Fatty oil, 11·5%, unsaponifiable matter

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

contains β-sitosterol (*J. sci. industr. Res.*, 1956, **15B**, 727).

A decorative plant commonly grown in gardens and on railway platforms as screens throughout India.

***I. carnea** Jacq.

P.–*Jangali akh*; U.P.–*Besharmi booti*.

The plant is toxic to livestock.

Leaves contain a polysaccharide ipomose, an anthracene glucoside, a gum, jalapin and saponins. The presence of two toxic principles, one sol. in water and the other in ether, is reported. Intravenous administration of water-sol. toxin causes haemolysis and reduces blood pressure; the ether-sol. one affects the central nervous system, including the respiratory and cardiac regulatory centres. Oral administration of ether-sol. toxin acts as a mild purgative (*Indian Fmg, N.S.*, 1955-56, **5**, 39; *Wlth India*, V, 248).

Native of South America and introduced into India as an ornamental plant and cultivated in gardens, sometimes as a hedge.

***I. coptica** (Linn.) Roth apud. R. & B.; see **I. dissecta** Willd.

I. dasysperma Jacq. f.=**I. tuberculata** Ker.-Gawl.

G.–*Dipdavel*.

Seeds used as an antidote for hydrophobia (Kirt. & Basu, III, 1728).

Found in the upper Gangetic plain, Bombay, Madras and Kerala.

I. digitata Linn.; see **I. paniculata** R. Br.

I. dissecta Willd. syn. *I. coptica* (Linn.) Roth apud. R. & B.

Herb used in Ghana for chest complaints in children; a cold infusion of the plant is given for giddiness or intoxication in North Nigeria. Leaves reported to contain chlorogenic acid (*Wlth India*, V, 253).

I. fastigiata (Roxb.) Sweet syn. *I. tiliacea* (Willd. Choisy)

Roots purgative; contain an amorphous glycoside, ipomein, which on hydrolysis yields methylcrotonic acid and ipomoenic acid (*Wlth India*, V, 254).

***I. gomezii** C. B. Clarke; see **Merremia mamosa** (Lour) Hallier f.

***I. palmata** Forsk.; see **I. cairica** (Linn.) Sweet

I. paniculata R. Br. syn. *I. digitata* Linn.

Tubers yield β-sitosterol (*Indian J. appl. Chem.*, 1964, **27**, 155).

I. pes-caprae (Linn.) Sweet syn. *I. biloba* Forsk.

Organic acid metabolism (*J. biol. Sci.*, 1960, 86).

I. pes-tigridis Linn.

The plant is used as a feed for livestock; seeds resemble sunhemp seeds (*Indian J. vet. Sci.*, 1957, 45).

***I. purpurea** (Linn.) Roth

The plant is used as a purgative and antisyphilitic by the Zulus in South Africa. The stem yields a soft resin (4·8%), its active principle. It contains ipuranol, identical with sitosterol glucoside, ipurolic acid (*Wlth India*, V, 252).

Found throughout the greater part of India up to 2000 m. in the Himalayas. Occasionally grown in gardens for its flowers.

I. quamoclit Linn.; see **Quamoclit pennata** (Desr.) Bojer

***I. tiliacea** (Willd.) Choisy; see **I. fastigiata** (Roxb.) Sweet

I. tridentata Roth.; see **Merremia tridentata** (Linn.) Hallier f.

***I. tricolor** Cav. syn. *I. violacea* Linn.

English–*Morning glory*.

The active principle in seeds is an ergot alk.; other crystalline compounds are D-lysergamide, D-isolysergamide and chanoclavine. D-lysergamide produces psychosis-like state and has a narcotic action (*Chem. Abstr.*, 1961, 16915 *f*; *Bot. Mus. Leafl., Harv. Univ.*, 1963, **20**, 194; *Chem. Abstr.*, 1964, **60**, 3945).

Tropical America; grown in Indian gardens.

***I. violaceae** Linn.; see **I. tricolor** Cav.

IRIS (*Iridaceae*)

I. germanica Linn.

English–*Orris, Orris root* or *Iridis rhizoma*.

A rich source of ascorbic acid.

Exts. of leaves are employed for the treatment of frozen feet. The leaves contain β-carotene and traces of α-carotene (*Chem. Abstr.*, 1940, 4425; 1942, 6198; 1947, 5584). Orris possesses stimulant, cathartic and diuretic properties and is used in bronchitis, dropsy and liver complaints; as powder or in poultice, it is applied to sores and pimples (Nadkarni, 694).

Essen. oil from rhizomes from Morocco (*C.R. Acad. Sci., Paris*, 1954, **288**, 2444; *Chem. Abstr.*, 1955, 4945 *c*).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

I. kumaonensis Wall.
Isolation of iridin (*Indian J. Chem.*, 1963, **1**, 230).

ISOTOMA (*Campanulaceae*)

***I. longiflora** Prewl.; see **Laurentia longiflora** (Linn.) Endl.

IXORA (*Rubiaceae*)

***I. arborea** Roxb. ex Sm.; see **I. parviflora** Vahl

I. coccinea Linn.
Roots, sedative and stomachic and used in hiccup, fever, gonorrhoea, loss of appetite, diarrhoea and dysentery. They stimulate gastric secretions and bile and provide relief in abdominal pain. Roots are astringent and antiseptic, applied to sores and chronic ulcers.
Flowers are employed in the treatment of dysentery, leucorrhoea, dysmenorrhea, haemoptysis and catarrhal bronchitis. A decoction of the flowers or the bark used as a lotion for eye troubles and for sores and ulcers. The leaves are used in diarrhoea (*Wlth India*, **V**, 276).

JASMINUM (*Oleaceae*)

J. grandiflorum Linn.; see **J. officinale** Linn. var. **grandiflorum** Bailey

J. officinale Linn. var. **grandiflorum** Bailey
English–*Common jasmine.*
Production of otto, attars, etc. (*Perfum. essent. Oil Rec.*, 1951, 188, 235, 259; 1958, 297; *Indian Soap J.*, 1950-51, 253). The ketolactone from the essen. oil shown as lactone IV — its structure (*Helv. chim. acta*, 1964, **47**, 1152).
Three species, *J. grandiflorum*, *J. sambac* and *J. auriculatum*, grown in Uttar Pradesh; yield of flower per acre per year and yield of oil in flowers [*Econ. Bot.*, 1957, **11**(2), 178].

J. sambac Ait.
English–*Arabian jasmine*, *Tuscan jasmine.*
The otto from *J. sambac* (*Perfum. essent. Oil Rec.*, 1953, 11).

JATEORHIZA (*Menispermaceae*)

Columbin, the major nitrogen-free bitter principle of the roots and its transformation products (*J. Amer. chem. Soc.*, 1956, 5317).

JATROPHA (*Euphorbiaceae*)

J. curcas Linn.
Pressed oil from seeds (yield 25%), a disagreeable taste and more purgative than castor oil (*Agronomia La Molina*, 1952, **17**, 70, 117). Composition of the fatty oil (*Indian J. appl. Chem.*, 1964, **27**, 109).
Chemical examination of the seeds (*J. Instn Chem. India*, 1959, 213). Observations on pharmacological action [*Arch. int. Pharmacodyn.*, 1961, **130** (1/2), 28].

J. glandulifera Roxb.
Seeds contain a fixed oil (20-22%) (*J. Indian chem. Soc.*, 1949, 523; 1954, 407). The oil possesses purgative properties. It is applied externally in rheumatism and paralytic affections (*J. Indian chem. Soc. industr. Edn*, 1954, 197).
Aq. exts. of the fresh sap possess emulsifying and gel-forming properties. The gel obtained with benzyl benzoate may be used as an application for skin diseases. The root pounded with water is given to children suffering from abdominal enlargements; it causes purging and reduces glandular swelling (*Sci. & Cult.*, 1954-55, 243; *J. Indian chem. Soc. industr. Edn*, 1954, 197).

J. gossypifolia Linn.
Leaves contain a saponin, a resin and tannin. Saline sol. and ether exts. of shoots show antibiotic activity against *Esch. coli*. Latex from the trunk contains a volatile oil, possessing property of disintegrating lepromae (*J. sci. industr. Res.*, 1952, **11B**, 261).

JUGLANS (*Juglandaceae*)

J. regia Linn.
A globulin, juglansin, isolated from the kernels which also contain vitamins of the B group, as also vitamin A. The immature fruit is the richest source of ascorbic acid (*Wlth India*, **V**, 303).
Aq. exts. of leaves, free of juglone, possess strong bactericidal activity against microorganisms (*Chem. Abstr.*, 1955, 14095). Hydrojuglone glycoside (*Biochem. J.*, 1950, 452; *Chem. Abstr.*, 1951, 3125 *d*). Vitamins B and C in the Chinese drug (*J. Taiwan pharm. Ass.*, 1953, 5; *Chem. Abstr.*, 1954, 4178 *g*). A review of the chemistry and therapeutics (hydrojuglone and vitamin C) (*Pharmazie*, 1953, **8**, 90). The leaves and the green pericarp of the unripened fruit have phytocidic properties [*Sb. Trud. azerb. med. Inst.*, 1956, (3), 170; *Biol. Abstr.*, 1960, 42760].

JUNCUS (*Juncaceae*)

***J. effusus** Linn.
English–*Soft*, *Common* or *Matting rush.*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Decoction of the pith is considered antilithic, pectoral and discutient. The pith is used in China as diuretic and depurative and for keeping fistulous sores open.

Root—diuretic.

Plant—poisonous to cattle (*Wlth India*, V, 305).

Found in Sikkim Himalayas (1800-3000 m.), Khasi Hills, (1500-1800 m.) and Aka Hills in wet and marshy situations.

***J. inflexus** Linn. syn. *J. glaucus* Ehrh. ex Sibth.

English–*Hard rush.*

Plant is reported to be poisonous to animals, causes irritation of stomach and diarrhoea followed by nervousness and progressive blindness; the animal may die of cerebral haemorrhage preceded by convulsions (*Bull. Minist. Agric., Lond.*, No. 161, 1954, 87; *Wlth India*, V, 306).

Found usually in damp situations and distributed from Kashmir to Nepal, Aka Hills, Nilgiris and Palni Hills and the southern end of Western Ghats, ascending from 1800 to 2700 m.

***J. prismatocarpus** R. Br.

Reported to be cyanogenetic (*Bull. Coun. sci. industr. Res. Aust.*, 1948, No. 232, 66).

Found in the Himalayas from Punjab to Assam (up to 3000 m.), also in Madras, Western Ghats and Kerala in marshy places, pools and river banks.

JUNIPERUS (*Cupressaceae*)

J. communis Linn.

A review of the constituents, action and medical uses (*Pharmazie*, 1953, 8, 187).

Berries from E. Punjab yield 0·83% essen. oil, containing *d*-α-pinene (*J. Indian Inst. Sci.*, 1953, 35A, 43). Terpinenol-4, a diuretic material from berries [*Experientia*, 1957, 13(6), 255; *Biol. Abstr.*, 1958, 10023]. Constituents of essen. oil of berries from Italy and commercial juniper berry oil (*Nippon kagaku zasshi*, 1960, 81, 1766; *Chem. Abstr.*, 1962, 6103 *f*). Bark oil contains juniperene and juniperol (*Chem. & Ind.*, 1955, 384). Constituents from the bark: longifolene, juniperol, β-sitosterol, stigmasterol and the diterpene phenol, totarol (*J. sci. industr. Res.*, 1962, 21B, 236).

J. macropoda Boiss.

English–*Indian juniper, Himalayan pencil cedar.*

Fruits yield a volatile oil; its yield and characteristics (*For. Res. India*, 1945-46, 82; 1947-48, 76; 1950-51, 94; *Perfum. essent. Oil Rec.*, 1962, 53, 822).

J. recurva Buch.-Ham.

English–*Weeping blue juniper.*

The fruits yield an essen. oil (0·46-0·88%) (*For. Res. India*, 1947-48, 76; 1950-51, 94).

JURINEA (*Compositae*)

J. macrocephala Benth.

Commercial source of *dhoop*—its chemical evaluation (*Indian For.*, 1964, 288).

JUSSIAEA (*Onagraceae*)

***J. repens** Linn.

B.–*Kesara-dam*; Bihar–*Dhabni, Kesariba.*

Herb used as a paste or in poultices for ulcers and skin complaints (*Wlth India*, V, 311).

Occurs throughout the plains of India in ponds and marshes and on river banks.

J. suffruticosa Linn.

Plant considered astringent, carminative, laxative, diuretic and anthelmintic. The leaves are mucilaginous and used in Malaya for poulticing in headaches, orchitis, glands in the neck and nervous diseases. In Africa the plant enters into prescriptions for rheumatic pains (*Wlth India*, V, 311).

***J. tenella** Burm. f. syn. *J. linifolia* Vahl

Infusion of the root is given for syphilis. In Celebes, the plant is employed in poultices for pimples (*Wlth India*, V, 312).

Occurs in watery and swampy places in Bihar and Orissa and in some parts of South India.

JUSTICIA (*Acanthaceae*)

***J. betonica** Linn.

Tel.–*Tellarantu*; Tam.–*Velimungil*; Mal.–*Vellakurunji, Venkurini*; M.P.–*Mokandar*; Bihar–*Had-pat.*

The plant applied for swelling also used in diarrhoea. In Ceylon, the leaves are used as a poultice for boils (*Wlth India*, V, 312; Burkill, II, 1274).

Throughout India in rocky ravines, wastelands and hedges.

J. procumbens Linn. syn. *Rostellularia procumbens* (Linn.) Nees.

The plant is eaten in some parts of Bombay; considered laxative, diaphoretic, diuretic, alterative, expectorant, anthelmintic and febrifuge. An infusion of the herb is given in asthma,

Digitized by Arya Samaj Foundation Chennai and eGangotri

cough, rheumatism, backache, plethora, flatulence and lumbago. The juice of leaves is useful in ophthalmia. Leaf-decoction used in curvature and diseases of the bone (NADKARNI, I, 715; KIRT. & BASU, III, 1898; *Wlth India*, V, 313).

KALANCHOE (*Crassulaceae*)

***K. integra** (Medic.) Kuntze.

H.–*Haiza, Rungru, Tatara*; Kumaon–*Bakalpatta, Patkuari*; Nepal–*Hathokane*.

Leaves poisonous to goats; possess insecticidal properties. Expressed juice of the leaves of a bitter variety is anti-periodic, tonic and purgative (CHOPRA, 437; KIRT. & BASU, II, 1001).

Found in the tropical Himalayas from Kashmir to Kumaon up to 1800 m. and on Lushai Hills and in the Deccan.

KANDELIA (*Rhizophoraceae*)

K. rheedii W. & A. syn. *K. candel* (Linn.) Druce.

The bark does not have any effect on the blood-sugar of normal or alloxan-diabetic rabbits (*J. sci. industr. Res.*, 1957, **16A**, Suppl. 16).

KIGELIA (*Bignoniaceae*)

***K. pinnata** DC.

English–*Common sausage tree*.

The flowers contain an anthocyanin, cyanidin pentoseglycoside and three flavones, including quercetin and kaempferol. The bark contains a bitter substance and tannic acid (*J. sci. industr. Res.*, 1953, **12B**, 605; 1955, **14B**, 93).

The fruit is used in Africa as dressing for ulcers and for syphilis and rheumatism; it has purgative properties. The bark is used in rheumatism, dysentery and venereal diseases (*J. Indian chem. Soc. industr. Edn*, 1941, **4**, 236; *Wlth India*, V, 319).

Cultivated in many parts of India as an ornamental and roadside tree.

KIRGANELIA (*Euphorbiaceae*)

***K. reticulata** (Poir.) Baill. syn. *Phyllanthus reticulatus* Poir.

H.–*Panjuli, Buinowla*; B.–*Panjull*; G.–*Datwan*; M.–*Pavana*; Tel.–*Nallapali*; *Pulisar*; Tam.–*Abiranji, Nirppul*; Kan.–*Anamsule, Karesuli*; Mal.–*Kilaneli, Nirneli*.

Leaves diuretic and cooling; its juice used with camphor and cubebs (*Piper cubeba*) for bleeding gums, as also for diarrhoea in infants. Whole plant used in the treatment of smallpox and syphilis. Fruit, astringent and useful in inflammation and diseases of the blood. Decoction of root given to children for cough and catarrh.

The bark is alterative, attenuant, astringent and diuretic. Stem-juice used for eyes in Ghana (KIRT. & BASU, III, 2219-20; *Wlth India*, V, 321).

Occurs throughout tropical India ascending to 2500-2700 m. in Khasi and Jaintia Hills and in Andaman Islands.

KNEMA (*Myristicaceae*)

***K. angustifolia** (Roxb.) Warb. syn. *Myristica longifolia* Wall. var. *erratica* Hook. f.

Assam–*Mota-pasuti, Tezranga, Mamui*; Garo–*Bollanchi*; Khasi–*Diengson-lang-snam*; Nepal–*Ramguwa*.

The dried fluid from the tree or kino, is astringent and is used for dysentery and as an application for mouth sores in Assam. It resembles Malabar kino (from *Pterocarpus marsupium*) in appearance (*Wlth India*, V, 322).

Found in Sikkim Himalayas, Assam, Garo, Khasi and Jaintia Hills.

KOCHIA (*Chenopodiaceae*)

K. indica Wight

The plant contains pharmacologically active resinous alk. and an inactive acid (*Indian J. Pharm.*, 1959, 4).

A common weed in the irrigated saline soils of Punjab.

K. scoparia Schrad.

The plant is rich in protein and carbohydrates (*Sci. Agric.*, 1952, **32**, 463). It is used in China for medicinal purposes; the fruits and leaves said to possess cardiotonic and diuretic properties. Leaves and seeds contain saponin (KIRT. & BASU, III, 2081; *Wlth India*, V, 324).

Found in Upper Gangetic plain and Punjab.

KOPSIA (*Apocynaceae*)

***K. fruticosa** A. DC.

English–*Pink kopsia*.

Tel.–*Gutti-ganneru*.

The leaves and bark contain a bitter indole alk., kopsine (*Sci. & Cult.*, 1962, **28**, 1956). The alk. possesses cholinergic action. In Malaya, the root is used for poulticing ulcerated noses in tertiary syphilis (*J. Amer. chem. Soc.*, 1949, 3370; 1953, 381; *Sci. & Cult.*, 1952-53, 293; 1956-57, 120; *Nature, Lond.*, 1957, 916; *Wlth India*, V, 325).

A native of Burma and Malaya, often cultivated in Indian gardens as an ornamental plant.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

KRAMERIA (*Polygalaceae*)

***K. triandra** Ruiz & Pav.
English–*Peruvian rhatany, Krameria roots.*

Peruvian Rhatany is astringent and tonic in the form of dry ext. and in tinctures. It is used in diarrhoea and passive haemorrhages and locally in leucorrhoea and ophthalmia. It is also used as dentifrice and for mucous discharges in menstrual disorders and incontinence of urine (*Wlth India*, V, 325).

The activity of the drug (especially bark) is due to the presence of phlobatannin, krameria (rhatania) and tannic acid (8-9%).

Native of South America but imported into India.

KYLLINGA (*Cyperaceae*)

K. triceps Rottb.
Essen. oil from the roots (*Parfum. cosmet. Savons*, 1959, **2**, 215).

LACTUCA (*Compositae*)

***L. indica** Linn. syn. *L. brevirostris* Champ.

Leaves—tonic, digestive and depurative. In Abor Hills, the dried latex is used as a substitute for opium (Burkill, II, 1295).

Found in Sikkim Himalayas, Assam and Khasi Hills. It is cultivated in southern Japan and China.

L. remotiflora DC.
The plant is reported to be used for chronic obstructions of liver and bowels and as diuretic in calculous affections.

L. runcinata DC. syn. *L. heyneana* DC.
The plant reported diuretic, tonic and slightly aperient.

A common weed in many parts of India.

L. sativa Linn. syn. *L. scariola* Linn. var. *sativa* C. B. Clarke
English–*Garden lettuce.*

Garden lettuce like other species of Lactuca yields lactucarium used as hypnotic in bronchitis and asthma. Lettuce is used in poultices for burns and painful ulcers (Nadkarni, I, 720; Kirt. & Basu, II, 1441). In nutritive value it is classed with cauliflower, celery and asparagus, chiefly valued for its vitamin (vit. E, vit. G, vit. K, and choline) and mineral contents (*Wlth India*, V, 14).

L. serriola Linn.
English–*Prickly lettuce.*

The seeds yield 35·2% of a semi-drying oil, reported to possess hypnotic and antipyretic properties; composition of seed oil (*J. Indian chem. Soc.*, 1945, 127; *Indian Soap J.*, 1946-47, 49).

The milky latex yields lactucarium.

LAGENARIA (*Cucurbitaceae*)

L. siceraria (Mol.) Standl. syn. *L. vulgaris* Ser.
English–*Bottle gourd, Calbash gourd.*

Fruit—analysis of edible portion (*Indian J. med. Res.*, 1956, 749; *J. sci. industr. Res.*, 1956, **15B**, 39; *Food Res.*, 1956, 477). It is a good source of vitamin B and ascorbic acid (*Wlth India*, VI, 18). Kernels from ripe seeds gave 45% oil (*Sci. & Cult.*, 1953, 163). Seeds are used in dropsy and as anthelmintic; the roots also in the treatment of dropsy. The seed oil is applied in headaches (Kirt. & Basu, II, 1117).

LAGERSTROEMIA (*Lythraceae*)

L. flos-reginae Retz.; see **L. speciosa** (Linn.) Pers.

L. speciosa (Linn.) Pers.
English–*Queen crape, Myrtle.*

Aq. ext. of the leaves (called the drug 'banoba'), has hypoglycemic properties; it showed the presence of alanine, isoleucine, α-aminobutyric acid and menthoeonine—no alks., no glucosides, no sterols and no flavonoids (*Nature, Lond.*, 1961, **190**, 1108).

LAMINARIA (*Phaeophyceae*)

L. saccharina Lam.

Volatile constituents of Laminaria sp.—furfuryl alcohol, 1:8-cineol, linalool, geraniol and eugenol (*Bull. Jap. Soc. sci. Fish.*, 1959, 925; *Biol. Abstr.*, 1961, 8701).

LAMIUM (*Labiatae*)

L. album Linn.
English–*White deadnettle.*

The herb is diuretic (*Biol. Abstr.*, 1959, 11434).

Flowers are used as a mild astringent, haemostatic, hypnotic and depurative in bleeding piles; useful against albus, chlorosis and debilities. The flowers contain choline, kaempferol and kaempferol 3-glucoside, etc. The leaves are edible, and a good source of carotene (*Wlth India*, VI, 26).

***L. amplexicaule** Linn.
English–*Henbit.*

Plant—stimulant, laxative, diaphoretic, antirheumatic and cephalic. It contains carotene and ascorbic acid. In Australia the plant is reported to cause poisoning to cattle (*Wlth India*, VI, 26).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Found in temperate Himalayas from Kashmir to Kumaon, Sikkim and Aka Hills in Assam.

LANSIUM (*Meliaceae*)

L. domesticum Correa

Pulp of the fruit is edible (*Indian J. agric. Sci.*, 1959, 151). The peel of the fruit emits a volatile oil, 0·2% and a brown resin, 3·5% from fresh peel and 22% resin from dried peel. The resin is non-toxic and useful in diarrhoea and intestinal spasm (*Wlth India*, **VI**, 30)

LANTANA (*Verbenaceae*)

L. camara Linn.

Alkaloidal fraction of the leaves lowers blood pressure, accelerates deep respiration and causes shivering in dogs. It stimulates intestinal movements and inhibits uterine motility in rats. The alks. may thus find application in the treatment of asthma, bronchitis, arterial hypotension and fever (*Egypt. Pharm. Bull.*, 1959, **41**, No. 6, 93; *Chem. Abstr.*, 1960, 21644 *h*).

Of the three varieties of *L. camara* reported from India, var. *aculeata* Moldenke is the most common. The occurrence of *L. camara* proper in India is doubtful (*J. Indian bot. Soc.*, 1957, 35). Essen. oil from leaves and tender stems of plants collected from Allahabad and Delhi (0·23-0·32%) (*Indian Perfumer*, 1960, **4**, pt. I, 15).

***L. camara** Linn. var. **aculeata** Moldenke syn. *L. camara* Linn.

English–*Lantana, Wild sagi.*

Mar.–*Chadurang, Ghaneri*; Tel.–*Pulikampa*; Tam.–*Unnichadi*; Kan.–*Nata hugida, Hesika, Kakke*; Mal.–*Arippu*, M.P.–*Raimuniya.*

Leaves contain a toxic principle 'landene A' which causes acute photosensitization and severe icterus in sheep. It also contains 'landene B' which is inactive, and lancamarone, a fish poison and cardioactive. The bark and roots contain alk. lantanine, with antipyretic and antispasmodic properties. Acid exts. of the shoots show antibacterial activity (*J. chem. Soc.*, 1954, 3989; 1956, 4160; *J. sci. industr. Res.*, 1952, **11B**, 261; 1957, **16B**, 514).

Contains lancamarone, cardioactive and a fish poison, which is effective in a dilution of 1 in a million (*J. sci. industr. Res.*, 1957, **16B**, 514).

Introduced into India and completely naturalized.

L. indica Roxb.

Fresh leaves contain essen. oil (yield 0·07%) (*Saugar Univ. J.*, 1958, **7**, pt. II, Sect. A, No. 7, 49).

LATHYRUS (*Leguminosae*)

***L. odoratus** Linn.

English–*Sweet pea.*

Pigments present in the flowers, mostly anthocyanin (*J. sci. industr. Res.*, 1953, **12B**, 605). Seeds are a good source of vitamin A (*Chem. Abstr.*, 1953, 5786). A diet containing sweet pea seeds to rats produces reproduction failure, dissecting aneurysm of aorta and degenerative arthritis, symptoms different from those of lathyrism in human beings. The toxic principle identified as β-(γ-L-glutamyl)-aminopropionitrile (*Food Sci.*, 1957, 156; *J. Amer. chem. Soc.*, 1954, 2848; *J. agric. Fd Chem.*, 1957, 367; *Wlth India*, **VI**, 37).

Commonly grown in Indian gardens, indigenous to Italy.

L. sativus Linn.

English–*Chickling vetch, Grass pea.*

Seeds, their analysis (*Chem. Abstr.*, 1951, 3041; 1952, 2705; *Sci. & Cult.*, 1958-59, 291; *Ann. Biochem.*, 1958, 157; *Indian J. med. Res.*, 1936-37, 1001; 1956, 50; *Indian J. Physiol. Pharmac.*, 1952, 61). Vitamins in seeds (*Indian Pharm.*, 1949-50, 21, 63, 202; *Food Res.*, 1954, 134; 1955, 545). Analysis of seed ash (2·6-2·8% yield) (*Indian J. med. Res.*, 1955, 497; *Rep. Indian vet. Res. Inst., Muktesar Izatnagar*, 1949-50, 43; *Nature, Lond.*, 1952, 124). Isolation of a new amino acid (*Biochim. biophys. Acta*, 1961, 602; *Biol. Abstr.*, 1962, 3299). Non-toxic character and nutritive value of seeds (*Indian J. med. Res.*, 1963, 51, 468).

***L. sphaericus** Retz.

The plant is poisonous; its seeds often get mixed with Khesari in fields (*Bull. Indian Coun. agric. Res.*, 1956, No. 76, 34).

Found in the plains of North India and in Western Himalayas up to 1600 m. alt.

LAURENTIA (*Campanulaceae*)

***L. longiflora** (Linn.) Endl. syn. *Lobelia longiflora* Linn., *Isotoma longiflora* Presl.

The plant is poisonous. When taken internally it causes violent purgation which may prove lethal. The juice of the plant produces burning inflammation on contact with eyes or lips. Particularly harmful to horses.

An alk. similar to lobeline isolated from the plant, which acts on respiration by way of chemoreceptors of the carotid body, on blood pressure by way of spinal neurons and by discharge of adrenaline (*Wlth India*, **VI**, 43).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

It is found as a weed in wastelands in some parts of Bombay and sometimes grown in gardens for ornamental purposes.

LAURUS (*Lauraceae*)

L. nobilis Linn.
English–*Sweet bay, True laurel.*
Essen. oil of leaves (*R.C. Semin. Sci. Cagliari*, 1952, **22**, 63; *Chem. Abstr.*, 1954, 7262 *h*; GUENTHER, IV, 204).
Essen. oil of berries (*Indian Perfumer*, 1958, **2**, pt. I, 39; *Perfum. essent. Oil Rec.*, 1960, **51**, 351).

LAVANDULA (*Labiatae*)

L. angustifolia Mill.; see **L. vera** DC.

L. officinalis Chaix; see **L. vera** DC.

L. spica Loisel.; see **L. vera** DC.

***L. stoechas** Linn.
English–*French lavender.*
Flowers used in perfumes, medicated pillows or cushions, herb sachets and fumigating powders. Oil of *L. stoechas* is prescribed in colic and chest affections and for relieving biliousness and nervous headaches; also a moth repellent; fomentation with flowers relieves rheumatic and neuralgic pains (*Wlth India*, **VI**, 47; *Perfum. essent. Oil Rec.*, 1956, 232).
Essen. oil yield 0·75% of strong camphoraceous odour (GUENTHER, III, 515).

***L. vera** DC. syn. *L. angustifolia* Mill.; *L. officinalis* Chaix; *L. spica* Loisel.
English–*True lavender, Common lavender.*
Oil of lavender, concretes and absolutes (GUENTHER, III, 453; *Pharmazie*, 1960, **15**, 126; *Chem. Abstr.*, 1960, 16752 *e*).
Native of the mountainous districts of Europe. Cultivation attempted in some parts of India.

LAWSONIA (*Lythraceae*)

L. inermis Linn. syn. *L. alba* Lam.
English–*Henna.*
Colouring matter from leaves, lawsone [*Punjab Fr. J.*, 1957, **21**(77), 17; *Indian For.*, 1958, 571; *Proc. Indian Acad. Sci.*, 1952, **35A**, 233; *Indian J. agric. Sci.*, 1959, No. 2-3, 147]. Essen. oil (0·02% yield), containing β-ionone (*Curr. Sci.*, 1950, 284).
Henna seeds yield a non-drying oil 5·6% (*Indian Oil Soap J.*, 1959, 145).

LEEA (*Vitaceae*)

L. aequata Linn. syn. *L. hirta* Roxb. ex Hornem.
The plant possesses antitubercular properties. Essen. oil (yield 0·15%) inhibits the growth of *Mycobacterium tuberculosis*, *Micrococcus pyogenes* var. *aureus* and *Pasteurella pestis* in concentrations of 10 μg./cc., 100 μg./cc. and 50 μg./cc. respectively (*Indian J. med. Res.*, 1953, 427).

LEMNA (*Lemnaceae*)

***L. minor** Linn.
English–*Common duckweed.*
Duckweeds are reported to possess cooling, astringent, antiscorbutic and diuretic properties and are used for cutaneous diseases and as wash for ophthalmia. *L. minor* is employed in homoeopathy (STEINMETZ, 642).
Reported as occurring in many parts of the country as aquatic weed in ponds and stagnant pools.

***L. paucicostata** Hegelm.
Properties and habitat similar to *L. minor* Linn.

LENS (*Leguminosae*)

L. culinaris Medic. syn. *L. esculenta* Moench; *Ervum lens* Linn.
English–*Lentil.*
Protein contents of lentils (*Indian J. med. Res.*, 1936-37, 1027; *Ann. Biochem.*, 1955, 75). Biological value and digestibility coefficient of the proteins and their nutritive value (*Indian J. agric. Sci.*, 1939, 133; *Food Sci. Abstr.*, 1952, 381; *Indian J. med. Res.*, 1953, 185; *J. sci. industr. Res.*, 1955, **14C**, 100). Lentil, a good source of vitamins of the B group (*Indian Pharm.*, 1949-50, **13**, 63, 121, 202; *Food Res.*, 1951, 230; 1952, 402; 1954, 134; 1955, 545; *Science*, 1951, 600). Mineral constituents (*Indian J. med. Res.*, 1955, 497; *Wlth India*, **VI**, 64).

LEONOTIS (*Labiatae*)

L. nepetaefolia R. Br.
Seeds analysis (*Chem. Abstr.*, 1946, 747; 1949, 3491). The seeds possess antimalarial activity (*Chem. Abstr.*, 1949, 3491).

LEONURUS (*Labiatae*)

L. cardiaca Linn.
English–*Common motherwort.*
The dried plant contains alks. (0·35%), saponins, tannins, bitter principles and traces of vitamins A and C. The alkaloidal fraction yields stachydrine (*Chem. Abstr.*, 1947, 7677).
Tannin substances of leaves, flowers and stems (*Referat. Zh. Khim Biol. Khim.*, 1955, No. 8409; *Chem. Abstr.*, 1956, 5989 *d*).

Digitized by Arya Samaj Foundation Chennai and eGangotri

Stachydrine alk., isolation (0·015 or 0·055%) in fresh or dry material (*Acta polon. pharm.*, 1960, **17**, 13; *Chem. Abstr.*, 1960, 13542 *f*).

Three bitter glycosides, isolation (*Arzneimittel-Forsch.*, 1961, **11**, 830; *Chem. Abstr.*, 1962, 6091 *d*).

L. sibiricus Linn.

English–*Siberian motherwort.*

The dried plant is tonic, alterative, vulnerary and emmenagogic; employed in puerperal and menstrual disorders. The leaf ext. effective towards uterus contraction. The plant contains an alk., leonurine (0·05% yield), which has a curare-like effect on motor endings; small doses act as a respiratory stimulant and in large doses causes respiratory paralysis (*Wlth India*, **VI**, 67).

LEPIDAGATHIS (*Acanthaceae*)

***L. hyalina** Nees syn. *L. incurva* D. Don

Leaves are chewed to relieve cough (*Wlth India*, **VI**, 70).

Found throughout northern India from Jammu to upper Assam up to 1500 m. and in Andhra, Madras, Kanara and Konkan.

LEPIDIUM (*Cruciferae*)

L. iberis Linn.

H.–*Towdri.*

***L. iberis** var. **alba**

H.–*Safed towdri.*

Seeds used in Indian medicine; on extraction give 5·5% of oil. The unsaponifiable matter contains phytosterol and sitosterol. Seed mucilage contains 19-20% cellulose (*Arch. Pharm. Berl.*, 1957, **290**, 215, 257).

Found in southern Europe and extends to Siberia. Imported into Bombay from Persia.

L. latifolium Linn.

Infusion of the plant is used against liver and kidney diseases; it increases cardiac amplitude, decreases frequency and regulates the rhythm; it depresses temporarily the blood pressure in dogs. The plant contains resin, two alks., flavonic compds. and saponin (*Congr. Luso-espan. farm.*, 1952, 218; *Chem. Abstr.*, 1954, 11727).

L. ruderale Linn.

Aq. ext. of the herb causes a drop in blood pressure and depresses respiration (*Wlth India*, **VI**, 73).

L. sativum Linn.

English–*Garden cress.*

Leaves consumed raw in salads. Analysis of leaves: water, 82·3; protein, 5·8; fat, 1·0; carbohydrate, 8·7; mineral matter, 2·2; calcium, 0·36 and phosphorus, 9·11%; trace elements: iron (28·6 mg./100 g.), nickel (40 μg./kg.), cobalt (12 μg./kg.) and iodine (110 μg./kg.); vitamin: vitamin A, 2·970 i.u.; thiamine, 0·11; riboflavin, 0·17; niacin, 1·0% and ascorbic acid, 87 mg./100 g. (*Wlth India*, **VI**, 72).

Essen. oil (Cress Oil, yield 0·115%). Volatile products of leaves show antibacterial activity against *Bacillus subtilis* and *Micrococcus pyogenes* var. *aureus* (*Chem. Abstr.*, 1953, 12503). Cress seeds contain an alk. (0·19%), sinapic acid and its choline ester and a volatile oil. The oil has oestrogen activity (*Chem. Abstr.*, 1953, 4048). The seeds yield up to 25·5% of a semi-drying oil (*J. sci. industr. Res.*, 1956, **15B**, 725). The seed mucilage is known as Cress seed mucilage, a substitute for tragacanth and gum-arabic (*Wlth India*, **VI**, 72). Seeds common adulterant of *Plantago ovata* seeds; chemical examination (*J. sci. industr. Res.*, 1961, **20C**, 60). Seed oil (14·1% yield) consists of palmitic, stearic, oleic and linolenic acids (*Indian J. appl. Chem.*, 1964, **27**, 71).

LEPTADENIA (*Asclepiadaceae*)

L. reticulata Wight & Arn. syn. *Gymnema aurantiacum* Wall. ex Hook. f.

Alcoholic (50%) ext. of roots and leaves show antibacterial activity against certain Gram-positive and Gram-negative bacteria. Intravenous administration of aq. ext. has a hypotensive action in dogs; appears to be non-toxic (*Indian J. Pharm.*, 1958, 241; *Indian J. med. Res.*, 1960, 457). The plant is useful in the treatment of habitual abortion in women (*Antiseptic*, 1958, 487; *Wlth India*, **VI**, 74). A fructosan (7-8 hexose units) of the inulin type separated from the tubers (*J. sci. industr. Res.*, 1951, **10B**, 324).

LEPTONYCHIA (*Sterculiaceae*)

***L. heteroclita** (Roxb.) Kurz. syn. *L. glabra* Turcz.

The leaves are reported to be used in poultices for ulcers; a decoction of the roots taken before childbirth and as febrifuge (BURKILL, II, 1334).

Found in South Andamans.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

LEUCAENA (*Leguminosae*)

L. glauca Benth.

English–*White popinag, Lead tree.* G.–*Lasobaval*; Tel.–*Kaniti*; Tam.–*Tagarai, Nattuccavundal*; Mal.–*Takaranniram*; Oriya–*Rajokasundiri*; Lakhimpur–*Toira kadam*; Guntur–*Nagarikesari.*

Tops, leaves, pods and seeds are relished by cattle, sheep and goats. When consumed in excessive quantities, all parts are toxic to monogastric animals, like horses, pigs, rabbits and chickens, causing great loss of hair. Many of the toxic symptoms observed are similar to those of selenium poisoning (*L. glauca* has the property of extracting selenium from the soil and concentrating it in the seeds). But toxicity is due to an alk., leucenine or leucenol, reported to be identical with mimosine (from *Mimosa pudica* L.) (*Wlth India*, **VI**, 78).

LEUCAS (*Labiatae*)

L. aspera Spreng.

An alcoholic ext. of leaves shows antibacterial activity against certain organisms (*J. sci. industr. Res.*, 1947, **6B**, 42).

LEUCONOTIS (*Apocynaceae*)

L. eugenifolius A. DC.

Stems yield alks.; leaves give triterpenoids, lupeol acetate and leuconos (*J. Indian chem. Soc.*, 1959, **36**, 92). Stem-barks give β-amyrin (*J. sci. industr. Res.*, 1962, **21B**, 506).

LICUALA (*Palmae*)

***L. spinosa** Wurmb.

H.–*Jungli selai.*

Bark—an ingredient of drugs used in Cambodia for the treatment of tuberculosis. Alcohol and chloroform exts. of the leaves show indication of inhibition against *Mycobacterium tuberculosis* (*Philipp. J. Sci.*, 1959, **88**, 245; *Wlth India*, **VI**, 91).

Found in the Andaman Islands, Java and Malacca.

LILIUM (*Liliaceae*)

***L. candidum** Linn.

Flowers antispasmodic, emit strong and heavy perfume. Absolute of lily used in high grade perfume compositions of floral and oriental type. It is an excellent fixative (**GUENTHER**, **VI**, 73). The pollen is used against epilepsy.

Bulbs astringent, mucilaginous, demulcent, diuretic, expectorant and emollient. A decoction of the bulbs in milk or water is taken for dropsy; a poultice for external application for tumours, ulcers and skin inflammations (**STEINMETZ**, 655; U.S.D., 1947, 1506).

Occurs in S. Europe, S.W. Asia and N. Persia. It is grown in Indian gardens.

***L. martagon** Linn.

English–*Turk's-cap lily, Turban lily.*

The bulbs possess the same medicinal properties as those of *L. tigrinum*.

Found in Southern Europe, commonly grown in Indian gardens.

***L. tigrinum** Ker-Gawl.

English–*Tiger lily, Crumple lily.*

Bulbs useful for relieving heart diseases, pain in the cardiac region and angina pectoris; expectorant, diuretic, emmenagogue and emollient (*Wlth India*, **VI**, 99).

Flowers carminative; strengthen eyelid muscles and commended in myoptic astigmia (**STEINMETZ**, 656).

Native of China and Japan and cultivated in Indian gardens.

LIMNOPHILA (*Scrophulariaceae*)

***L. aromatica** (Lam.) Merrill syn. *L. gratissima* Blume

H.–*Kuttra*; B.–*Karpur*; Mar.–*Ambuli*; Mal.–*Manganari.*

The plant yields an essen. oil (0·13%) containing principally *d*-limonene and *d*-perillaldehyde. It is antiseptic, galactagogue and aperient. Leaves used as poultice for sores on legs. The juice of the plant is given in fever and to nursing mothers when the milk is sour (*Wlth India*, **VI**, 116).

Found in South Bihar, Orissa, Sundarbans, Aka Hills (Assam), Deccan and western Peninsula up to 600 m. in damp places and backwaters.

L. roxburghii G. Don syn. *L. rugosa* (Roth) Merrill

B.–*Kalakarpur*; Mundari–*Losod ba.*

Leaves contain essen. oil and taste like *Ocimum basilicum* and used as a flavouring for food and as hair perfume. Infusion—diuretic, stomachic and digestive tonic (*Wlth India*, **VI**, 116).

Almost throughout India.

LINDERA (*Lauraceae*)

***L. caudata** Benth.

Khasi–*Dieng-soh-orthai, Dieng-brausalu.*

A decoction of the leaves is taken in China to relieve pain caused by mechanical injury (*Wlth India*, **VI**, 117).

Found in Khasi and Naga Hills in Assam.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

LINDERNIA (*Scrophulariaceae*)

***L. cordifolia** (Colsmann) Merrill syn. *Vandellia pedunculata* Benth.
Mar.–*Gadagvel*.
Used as a remedy for gonorrhoea. In Malaya *L. cordifolia* is used as a substitute for *L. crustacea*.
Found almost throughout India up to 1200-1700 m. in the Himalayas.

***L. crustacea** (Linn.) F. Muell. syn. *Vandellia crustacea* (Linn.) Benth.
The plant is reported to contain a bitter principle; used for bilious affections and dysentery in Indo-China. Elsewhere it is used in poultices for boils, sores, ringworm and itches (*Bull. econ. Indoch.*, 1934, 546; *Wlth India*, VI, 118).
Found throughout India ascending up to 1600 m. in the Himalayas in moist, open grassy places, rice fields, river-beds and ditches.

***L. oppositifolia** (Retz.) Mukerjee syn. *Vandellia oppositifolia* Haines
Mundari–*Hendegel ba, Garandi ara*.
The roots are used locally for fever.
The herb found in Bihar, Deccan, Carnatic, Bombay and West Coast.

***L. ruelloides** (Colsmann) Mukerjee syn. *Bonnaya reptans* Spreng.
Garo–*Sam-tham-lang, Sam-gichhok*.
It is used in Lakhimpur (Assam) in external application for worms in the skin.
The creeper is found in Nepal, Sikkim, Assam, Khasi and Garo hills, Orissa, Bombay and S. Konkan.

LINOCIERA (*Oleaceae*)

***L. ramiflora** (Roxb.) Wall. ex G. Don. syn. *L. intermedia* Wight
Tel.–*Satapala, Cedaneredu*; Kan.–*Kunde*; Oriya–*Musurdanta, Suliulikuda*.
The bark is bitter and used for intermittent fevers in Queensland (*Bull. Coun. sci. industr. Res. Aust.*, 1948, 121; *Wlth India*, VI, 118).
A shrub found in the sub-Himalayan tract from Ravi eastwards and in eastern, central and southern India up to 1800 m. alt.

LINOSTOMA (*Thymelaeaceae*)

***L. decandrum** Wall.
Assam.–*Bakalbih, Ruteng*.
The stems and fruit highly toxic; fish poisons extracted from the pulped-up fruit and stems (CHOPRA, 1933, 587).
Common in the forests of Assam up to an altitude of 1500 m. in Lushai Hills.

LINUM (*Linaceae*)

L. usitatissimum Linn.
English–*Linseed*.
Linseed for medicinal use should contain: foreign organic matter, ≯1·0; fixed oil, ≮25·0; ash, ≯5·0; and water-sol. exts. ≮15·0% (WARING, 1868, 368). Phosphatides (lecithin and cephalin) contents of crude linseed oil 1·25% (HILDITCH, 1956, 253-54). The protein contents of linseed (16-31%), principally two globulins, e.g. linin and colinin; digestibility coefficient and biological value of linseed proteins (*Wlth India*, VI, 127).
Besides linamarin, the cyanogenetic glucoside, linseed also contains two other glucosides, crystalline and non-crystalline. Linamarin is also present in the leaves, stems, roots and flowers, which causes death among livestock grazing on linseed plant. Other constituents reported are phytin, lecithin, etc. β-Carotene forms 22-30% of the total carotenoids (*Wlth India*, VI, 128).

LIPPIA (*Verbenaceae*)

***L. alba** (Mill.) N.E. Br. syn. *L. geminata* H. B. & K.
English–*Wild sage*.
Oriya–*Naga-aieri*; Mukir.–*Lopongbrik*; Sylh.–*Pichae-lakri, Pichas-bon*; Mundari–*Daru kaini ba*; M.P.–*Basula*.
The strongly aromatic plant is used as a sage in cookery. The leaves, which are used as vegetable in Khasi Hills, are considered stomachic and nervine in some parts of Brazil and Paraguay. Leaves on distillation yield essen. oil (*Chem. Abstr.*, 1955, 3479; 1957, 7658; *Sci. & Cult.*, 1961, 101). Essen. oil (yield 0·5%) contains 50% of the ketone, lippione (*Indian Soap J.*, 1963, 29, 75).
Found in wet situations and muddy river banks from Bihar to Assam, Orissa, Madhya Pradesh, Nilgiris and Anaimalais up to 900 m.

***L. citriodora** H. B. & K.=**Aloysia triphylla** (L' Herit.) Britton.
English–*Real vervain, Herba louisa, Sweet-scented verbena, Lemon-scented verbena*.
The leaves used for flavouring beverages, fruit salads and jellies. A decoction of leaves and flowers given as febrifuge, sedative, antiflatulent, antispasmodic and nervine (STEINMETZ, 662).
Essen. oil (oil of verbena) from stalks and leaves (0·1-0·7%) (GUENTHER, VI, 37). The oil is an effective insecticide in 1-2% concentration.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Indigenous to S. America and commonly grown in Indian gardens, especially on hills.

L. nodiflora Rich. syn. *Phyla nodiflora* (Linn.) Greene.

The plant is used in ischury, stoppage of bowels and pain in knee-joints. An alcoholic ext. of leaves shows antibacterial activity against *Esch. coli* (*J. sci. industr. Res.*, 1947, **6B**, 42). The leaves contain tannin (8%), fat (9%), rutin, a waxy ester and β-sitosterol (*Chem. & Ind.*, 1955, 1739). The plant yields two glucosidic colouring matters, nodiflorin-A and nodiflorin-B (*J. sci. industr. Res.*, 1959, **18B**, 525).

LIRIODENDRON (*Magnoliaceae*)

***L. tulipifera** Linn.

English–*Tulip tree, Yellow poplar, Shitewood* or *Canary wood of commerce.*

The bark of the root, trunk and branches is a bitter tonic, febrifuge, restorative and aromatic. Used in rheumatism and dyspepsia. The root bark contains an alk. tulipiferin; the inner bark yields liriodendrin, a lignan diglucoside (*Wlth India*, **VI**, 145).

Native of North America, introduced into some hill stations in India, where grown for its handsome foliage and large flowers.

LITCHI (*Sapindaceae*)

L. chinensis Sonner.

Litchi seeds, isolation of α-(menthylenecyclopropyl) glycine, which shows hypoglycaemic activity on being injected [*Biochem. J.*, 1962, **82**(3), 385]; leucocyanidine (*Curr. Sci.*, 1962, 56).

Sugars and amino acids of the aril of fruit (*Curr. Sci.*, 1964, 184).

LITHOSPERMUM (*Boraginaceae*)

L. officinale Linn.

English–*Gromwell.*

The root is considered depurative.

A decoction of roots and twigs given in the form of syrup in eruptive diseases, such as smallpox, measles and itch.

The seeds are used as an electuary in gout and bladder diseases (STEINMETZ, 667).

The aerial parts and roots contain a substance which inhibits the secretion of the pituitary gonadotropic hormone. The exts. of the herb possess contraceptive properties (*Chem. Abstr.*, 1955, 12713; *Wlth India*, **VI**, 152). Hormonal antagonistic effect in contraception [*Acta phytother.*, 1959, 6(7), 126; *Biol. Abstr.*, 1960, **25**, 150].

Found in Kashmir and Kumaon at 1500-2700 m. alt.

LITSEA (*Lauraceae*)

L. chinensis Lam.; see **L. glutinosa** (Lour.) C. B. Robins.

***L. cubeba** Pers. syn. *L. citrata* Blume

Nepal–*Siltimur*; Lepcha–*Tanghaercherkung, Terhilsok*; Assam–*Majankeri*; Khasi–*Dieng-si-ing*; Garo–*Zeng-jil*, Lushai–*Sernam.*

The fruit is edible, aromatic and carminative and used in Indo-China for headache, dizziness, hysteria, paralysis and loss of memory; also used as a preservative for fish in Indonesia (*Wlth India*, **VI**, 153).

Essen. oil from fruits, a source of citral (yield usually 80%) (*Perfum. essent. Oil Rec.*, 1959, 79; *C.R. Acad. Sci., Paris*, 1959, 2029; *Chem. Abstr.*, 1960,13558 *b*).

Essen. oil from leaves (*J. Indian chem. Soc.*, 1951, **54**, 465, 517; *Chem. Abstr.*, 1953, 5637 *g*).

L. glutinosa (Lour.) C. B. Robins. syn. *L. chinensis* Lam.; *L. sebifera* Pers.

The fruit is edible. The seeds yield 35% of a fat, a rich source of lauric acid. The root is sweetish bitter, astringent and tonic; a decoction of the root is used as emmenagogue in Philippines (*Wlth India*, **VI**, 154).

***L. lancifolia** Hook. f.

Nepal–*Kali pahenle, Mahari, Kath.*

The bark is reported to contain laurotetanine; used in poultices for sprains and wounds (BURKILL, II, 1355).

Found in eastern Himalayas and Assam.

L. monopetala (Roxb.) Pers. syn. *L. polyantha* Juss.

The leaves have a cinnamon-like odour when bruised. The seed fat is used in ointments for rheumatism (*Wlth India*, **VI**, 155).

L. polyantha Juss.; see **L. monopetala** (Roxb.) Pers.

***L. zeylanica** C. & T. Nees.

Essen. oil (Bellary leaf-oil) from the leaves contains 35% ocimene, which is responsible for the resinification of the oil (*J. sci. industr. Res.*, 1953, **12B**, 243).

Cultivated in Attikan Estate, Chamarajanagar, Mysore.

LOBELIA (*Lobeliaceae*)

Lobelia spp.

Alkaloidal content in different species (0·445-0·752%), method of extraction with silicotungstic acid (*Rev. bras. Farm.*, 1954, **35**, 477; *Chem. Abstr.*, 1956, 10986 *f*).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

***L. chinensis** Lour. syn. *L. radicans* Thunb.

The plant is used in China for fevers and asthma. The root depurative and antirheumatic in Indo-China.

The rhizomes contain polyfructosan, lobelinin (*Wlth India*, VI, 159).

The herb found in Nepal, Chota Nagpur and Khasi Hills at altitudes of 900-1500 m.

L. excelsa Lesch.; see **L. leschenaultiana** (Presl.) Skottsh.

***L. inflata** Linn.

Chief source of the drug lobelia was official in B.P. and U.S.P. It is expectorant and is given in asthma and chronic bronchitis. If swallowed in small doses, it produces vomiting and nausea. In toxic doses, there is rapid and feeble pulse, fall of temperature and final collapse, with stupor or coma leading to death.

The drug owes its activity to several alks. (0·13-0·63%, av. 0·4%). These alks. are classified into three groups, viz. lobeline, lelobine and lobinine. Lobeline, the most active alk., is similar to nicotine. It is a primary stimulant and a secondary depressant (U.S.D., 1955, 768). Lobeline hydrochloride is official in Indian Pharmacopoeia.

The seeds also contain lobeline and are used as expectorant in cases of asthma.

The herb is indigenous to eastern United States and Canada. It does not occur in India, but has been grown in Darjeeling on a small scale. Its cultivation has been recommended in eastern Himalayas, Nilgiris and Kerala.

***L. leschenaultiana** (Presl.) Skottsh. syn. *L. excelsa* Lesch.

The leaves are reported to possess insecticidal properties. A spray of the infusion is used in the control of aphids, tingids and mites on vegetable crops. The plant is poisonous to man and livestock (*Mem. Dep. Agric. Madras*, 1954, No. 36, 1020).

L. nicotianaefolia Heyne

The herb is a rich source of alks. of lobeline group; a substitute for *L. inflata* (*Curr. Sci.*, 1945, 198; *Chem. Abstr.*, 1954, 10035; *J. Instn Chem. India*, 1960, 146).

The plant is poisonous and used as an antiseptic. The seeds contain an acronarcotic poison (*J. Bombay nat. Hist. Soc.*, 1954, 516).

***L. pyramidalis** Wall.

Lushai–*Beráwchal*.

The dried leaves and flowering tops of the plant contain 0·29-0·39% alks. (as lobeline) and may be used as a substitute for *L. inflata* (*J. sci. industr. Res.*, 1951, **10B**, 218).

Found in the Himalayas from Kumaon to Sikkim and Aka, Lushai and Khasi Hills in Assam at 900-2700 m. alt.

LONICERA (*Caprifoliaceae*)

***L. japonica** Thunb.

English–*Japanese honeysuckle*.

Lushai–*Leihruisen*.

The plant is used in China as an antipyretic, stomachic and in dysentery; dried flowers are considered diuretic. The plant contains tannin and a saponin. The flowers yield luteolin and *i*-inositol. The berries are rich in carotenoids, major component being cryptoxanthin (*Wlth India*, VI, 172).

The climber is found in Lushai Hills, Assam, at 750 m. alt. and commonly cultivated in gardens.

***L. periclymenum** Linn.

English–*Woodbine honeysucklc*.

Flowers—antispasmodic, diuretic, sudorific, expectorant, febrifuge, and astringent.

Leaves—laxative, slightly astringent.

Bark—anticatarrhal, diuretic, depurative, sudorific.

The plant contains salicylic acid, saponin, sugar and invertin (STEINMETZ, 673).

Cultivated in hill stations for its sweet-scented flowers.

LOTUS (*Leguminosae*)

L. corniculatus Linn.

English–*Bird's-foot trefoil*.

The flowers constitute an important source of nectar for honey-bees. They contain α-carotene, β-carotene, xanthophyll, xanthophyll epoxide, violaxanthin and a carotenoid (*Indian Bee J.*, 1953, 115; *Wlth India*, VI, 176).

LUDWIGIA (*Onagraceae*)

***L. perennis** Linn. syn. *L. parviflora* Roxb.

Mundari–*Sukuri pota, Gara sirgili*.

The plant, boiled with oil, is used by Mundas as an external application on the body for reducing fever.

Found throughout India, usually in rice fields, moist areas and river-banks.

***L. prostrata** Roxb.

Mundari–*Huring rangaini*.

The leaves are used by Mundas for aching muscles and toothache.

Found in rice fields and swamps in the upper Gangetic plain, Bihar,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Sikkim Terai, N. Bengal, Aka Hills (Assam) and Western Ghats.

LUFFA (*Cucurbitaceae*)

L. acutangula (Linn.) Roxb.

English–*Ridged* or *Ribbed gourd.*

Ridged gourd, the edible fruit contains free amino acids: arginine, glycine, threonine, glutamic acid, leucines (*Indian J. med. Res.*, 1956, 511; *J. sci. industr. Res.*, 1956, **15C**, 39). The ripe seeds contain bitter principles—cucurbitacins B, D, G and H. The roots contain cucurbitacin B and traces of C (*J. Indian chem. Soc.*, 1958, 480; *J. Sci. Fd Agric.*, 1957, 673, 679).

Chemical examination of the seeds—a crystalline bitter principle, cucurbitacin B and oleanolic acid (*J. Indian chem. Soc.*, 1958, **35**, 480).

Components of oil from the ripe seeds, yield of oil 19·9% (*Naturwissenschaften*, 1955, 344; *Wlth India*, **VI**, 178).

L. acutangula (Linn.) Roxb. var. **amara** Clarke syn. *L. amara* Roxb.

All parts yield a bitter principle identical with cucurbitacin B, provisionally named as 'amarin' (*J. sci. industr. Res.*, 1951, **10B**, 26; 1959, **18B**, 535).

L. aegyptiaca Mill. ex Hook. f.; see **L. cylindrica** (Linn.) M. Roem.

L. amara Roxb.; see **L. acutangula** (Linn.) Roxb. var. **amara** Roxb.

L. cylindrica (Linn.) M. Roem. syn. *L. aegyptiaca* Mill. ex Hook. f.

English–*Dish-cloth gourd, Vegetable sponge, Spongegourd.*

The fruit contains choline (choline chloride 10·45 mg./g.) and phytin (*Indian J. med. Res.*, 1953, 441). Free amino acids: lysine, arginine, aspartic acid, glycine, threonine, glutamic acid, alanine, tryptophan, phenylalanine and leucines (*Indian J. med. Res.*, 1956, 511).

The seeds contain a bitter principle, cucurbitacin B (*Indian J. Pharm.*, 1954, 225); a saponin, yielding sugars on hydrolysis (*Sci. & Cult.*, 1957-58, 154). The seeds yield a crystalline saponin, which on hydrolysis gives oleonolic acid and a neutral sapogenin (*Trans. Bose Res. Inst.*, 1958, **21**, 19). A colourless saponin from the black variety (*J. sci. industr. Res.*, 1960, **19B**, 507).

Reactions of 'Luffamarin', a crystalline substance from the seeds [*Proc. Indian Acad. Sci.*, 1959, **50**(A), 167].

L. echinata Roxb.

Fruits give three components including a crystalline substance, echinatin, and a saponin (*Indian J. Pharm.* 1957, 208). Oily solid separated from the fruit oil identified as hentriacontane and gyposgenin, a sapogenin from the saponins, the alcoholic ext. (*J. pharm. Sci.*, 1961, **50**, 687).

***L. echinata** var. **longystyla** Clarke

An apparent hybrid of *L. graveolens* Roxb. and *L. aegyptiaca* Mill. yields cucurbitacin B and a bitter saponin.

Bitter constituents of Luffa species, cucurbitacins B and E (*J. sci. industr. Res.*, 1961, **20B**, 360).

Found in Banda (U.P.).

***L. graveolens** Roxb.

Mesocarp of mature fruits yields cucurbitacin B and cucurbitacin E, two bitter principles (*J. sci. industr. Res.*, 1961, **20B**, 232). Seeds contain cucurbitacins B and E as also a saponin and an oil (yield 11·6%)(*J. sci. industr. Res.*, 1961, **20B**, 561; *Curr. Sci.*, 1949, 451).

Found in Bihar, Bengal, Eastern Himalayas and Sikkim.

LUMNITZERA (*Combretaceae*)

***L. racemosa** Willd.

B.–*Kripa*; Tel.–*Kadivi, Thandara*; Tam.–*Tipparathai*; Mal.–*Katakhantal*; Oriya–*Tunda.*

A fluid obtained from incisions made in the stem is employed in external applications for herpes and itches (Burkill, II, 1373).

Found on the coasts of Indian Peninsula and Andamans and Nicobar.

LUPINUS (*Leguminosae*)

L. albus Linn.

The seeds are medicinal and considered as deobstruent, alterative, anthelmintic and carminative. Seedlings and stems rich sources of asparagine (*Wlth India*, **VI**, 183).

Diurnal changes in alk. contents in *L. albus* and *L. luteus* Linn. (*Bull. Acad. pol. Sci. Cl. II Ser., Sci. biol.*, 1960, 339; *Biol. Abstr.*, 1962, **37**, 10938).

***L. angustifolius** Linn.

English–*Blue lupine.*

The seed-proteins contain 2 globulins and an albumin. The two globulins, globulin-1 and globulin-2, have number of amino acids. Though deficient in methionine, the proteins have high digestibility (90%) and biological value (53%) (*Wlth India*, **VI**, 184). The principal alk. of the seeds is *d*-lupinine. Germinated seeds are a rich source of asparagine (10-16%) (*Econ. Bot.*, 1948, 219).

Native of the Mediterranean region, but has been introduced into India as a

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

green manure plant for potato crop in Nilgiris.

***L. digitatus** Forsk.
English–*Blue lupine.*
Alks., D-epilupinine, D-epilupinine N-oxide and 'LV-1', (*Aust. J. exp. Biol. med. Sci.*, 1963, **41**, 123).
Cultivated in India.

***L. luteus** Linn.
English–*Yellow lupine.*
The plant is toxic to grazing animals. Seeds contain lupinine (0·43-0·73%) and sparteine (0·20-0·37%) and are also cyanogenetic (*J. Pharm., Lond.*, 1951, 905; 1955, 614). Sweet strains containing very low percentages of alk. evolved for use as fodder (*Nutr. Abstr. Rev.*, 1951-52, 749; *Wlth India*, VI, 185).
Native of Mediterranean region. Grown in Indian gardens.

LUVUNGA (*Rutaceae*)

***L. eleutherandra** Dalz.
The bark and leaves are used in Java for aches and rheumatism. The sap from the stems applied to gums for toothache (BURKILL, II, 137).
Found from Konkan southwards to Anamalai and Travancore hills in the western parts of the peninsula.

L. scandens (Roxb.) Buch.-Ham. ex Wight
Berries contain essen. oil (yield 2·5%) consisting of cineol 56%, cinnamyl-cinnamate 30% and methyl cinnamate 9% and others (*J. Indian chem. Soc.*, 1950, **27**, 379; *Perfum. essent. Oil Rec.*, 1959, 124). The seeds yield 10% of a non-drying oil (*Indian J. appl. Chem.*, 1960, 153).

LYCHNIS (*Caryophyllaceae*)

***L. githago** (Linn.) Scop. = **Agrostemma githago** Linn.
English–*Corn cockle.*
The seeds are poisonous to human beings and livestock, causing irritation of the alimentary tract, nervous troubles and loss of strength. The poisonous principle is a saponaceous glycoside.
Native of Europe, but introduced into India (*Indian Fmg*, 1950, 266).

***L. ruthenicum** Murr.
Ladakh–*Khichar, Khitsar.*
The shrub contains alks. Reported to be useful for the treatment of blindness in camels (*Chem. Abstr.*, 1941, 4154).
Found in alpine-arid localities of North Kashmir.

LYCOPERSICON (*Solanaceae*)

L. esculentum Mill.
Ripe tomatoes contain glucose and fructose with some sucrose and a keto-heptose (*J. agric. Fd Chem.*, 1954, 472). Ripe and unripe fruits contain all the essential amino acids, except tryptophan (*Sci. & Cult.*, 1953-54, 201; *J. sci. industr. Res.*, 1956, **15C**, 39). The principal organic acid in tomato is citric acid. The acidity increases from the green to the turning stage and then decreases as the fruit ripens (*Chem. Abstr.*, 1954, 8982). The chief colouring matters are carotenoids, β-carotene and lycopene. Maximum carotenoid contents are obtained when the fruit is allowed to grow under full exposure to light and allowed to mature on the vine (*Wlth India*, VI, 194).
Tomatoes contain a gluco-alkaloid, tomatine and traces of solanine (*Chem. Abstr.*, 1955, 8521). Unripe fruit reported to contain narcotine (*Wlth India*, VI, 195). Tomato seeds contain two globulins (α-globulin 13·97%, β-globulin 10·65%) (*Wlth India*, VI, 195).
Tomatine contents in leaves: av. 0·63 mg. per 100 g. Leaves yield alks., tomatine and tomatidine, which are antifungal; their pharmacological and toxicological reports (*U.S. Dept. Agric. Agric. Res. Service A.R.S.*, 1955, 73; *Chem. Abstr* 1956,10341 *d*).
Isolation of tomatidine from the roots of Rutger's tomato plant (*Chem. Abstr.*, 1952, 3221).
Effects of inorganic N-nutrition upon the amino acids and amides in the leaves and roots (*Contr. Boyce Thompson Inst.*, 1960, 425; *Biol. Abstr.*, 1961, **36**, 21679).

LYCOPODIUM (*Lycopodiaceae*)

***L. cernuum** Linn.
Lushai–*Kangrem.*
A decoction of the plant is used in Malaya as a lotion in beri-beri and also for coughs. An embrocation of the ashes in vinegar is used for skin eruptions.
Cernuine and small quantities of nicotine have been isolated from the plant (*Canad. J. Res.*, 1948, **B**, 1).
The herb is found throughout India, from Garhwal to Sikkim, Bhutan, Assam, Khasi and Lushai Hills and on the hills of S. India.

L. clavatum Linn.
Alks. from Jamaican variety: clavolonine, fawcettiine (fawcettimine), lycopodine, dihydrolycopodine and L-2-(acetyl dihydrolycopodine) [*Canad. J.*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Chem., 1961, **39**(5), 1090; *Biol. Abstr.*, 1961, 54219].

LYCOPUS (*Labiatae*)

L. europaeus Linn.

Exts. of the plant inhibit the action of thyrotropic hormone and the throxine output of thyroid (*Chem. Abstr.*, 1955, 16234).

LYCORIS (*Amaryllidaceae*)

***L. radiata** Herb.

In China, the globose bulbs are made into plaster and applied to burns and scalds.

Bulbous roots contain lycorine and other eight alks. and large amounts of starch. Dihydrolycorine as a substitute for emetine in amoebic dysentery (*Jap. J. Pharm. Chem.*, 1948, **20**, 8; *Chem. Abstr.*, 1951, 3565 *f*).

Lycoris alks. are expectorant and febrifuge (*Wlth India*, **VI**, 199).

Indigenous to China and Japan. Cultivated in Indian gardens.

LYGODIUM (*Polypodiaceae*)

***L. circinnatum** (Burm. f.) Sw.

The stipes are reported to be used in external applications for wounds in Indonesia.

Found throughout India up to an elevation of 600 m.

L. japonicum (Thunb.) Sw.

The plant is used as an expectorant. In China, a decoction of vegetative parts and spores is used as diuretic or cathartic (*Bot. Bull. Acad. sinica*, 1947, 299; *Wlth India*, **VI**, 200).

Found from Kashmir eastwards to Lushai Hills and rarely in Western Ghats up to an elevation of 2000 m.

***L. microphyllum** (Cav.) R. Br. syn. *L. scandens* Sw.

Mal.–*Curalvallipanna.*

A decoction of the leaves given in dysentery; it enters into many lotions. Leaves are applied in the form of poultice for skin diseases and swellings (*Medicinal Plants of Philippines*, Department of Agriculture and Natural Resources, Manila—Technical Bulletin 1951, 57).

Found in Bengal, Bihar, Orissa, Bombay and South India up to 900 m. in the hills.

MACADAMIA (*Proteaceae*)

***M. ternifolia** F. Muell.

The tree cultivated for its seeds, the kernels of which have a delicious sweetish taste.

The kernels yield a light yellow oil, resembling olive oil and may be used as salad oil and also for high grade soaps and medicinal purposes (*Wlth India*, **VI**, 201).

The young leaves and the outer covering of immature nuts are cyanogenetic (*Bull. Coun. sci. industr. Res. Aust.*, 1948, 136).

An evergreen tree, cultivated in gardens in Nilgiris in Madras State and in Mysore and U.P. Natural habitat Australia.

MACARANGA (*Euphorbiaceae*)

***M. denticulata** Muell. Arg.

B.–*Burna, Jagura*; Lepcha–*Numrokung*; Assam–*Jagle, Moralia.*

A decoction of the plant used as a cleansing agent for wounds in Malaya (BURKILL, II, 1382). The tree yields a red gum kino containing 10-15% tannin and 60-70% gum (WEHMER, II, 682; *Pakist. J. For.*, 1956, 78).

Found in eastern Himalayas, Assam Bengal, Bihar and Orissa up to 1500 m. elevation.

MACHILUS (*Lauraceae*)

M. macrantha Nees.

English–*Machilus.*

Bo.–*Golum, Kurma, Bobarsa, Pishia, Pisara.*

The roots yield phytosterols, glycosides and volatile oil, with indications of five alks., largest alk. being machiline. Machiline-HCl has a direct depressant effect in the mycocardium, lowers blood pressure but has no antibacterial activity (*J. Amer. pharm. Ass., Sci. Edn*, 1960, **49**, 659). Structure of machiline (*Yakugakuzasshi*, 1963, **83**, 218; *Chem. Abstr.*, 1963, **59**, 2874 *a*).

MACLURA (*Urticaceae*)

***M. pomifera** Schneid syn. *M. aurantiaca* Nutt.

English–*Osage orange.*

The ext. and juice are toxic, whereas 10% aq. infusion and ext. diluted 1 : 1 are not toxic but have cardiovascular potentialities (*Uchen. Zap. azerb. gos. Univ.*, 1961, 359; *Chem. Abstr.*, 1963, **59**, 6645 *g*).

The heartwood and root yield a non-toxic antibiotic useful as a food preservative (*Chem. Abstr.*, 1951, 7724).

Phytochemical investigation of fruits (*J. Amer. pharm. Ass.*, 1952, **41**, 4946).

Indigenous to North America, chiefly grown as a hedge plant elsewhere.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

MADHUCA (*Sapotaceae*)

M. indica J. F. Gmel. syn. *Bassia latifolia* Roxb.

Studies on mahua sterol (*J. Indian chem. Soc.*, 1958, 763).

M. longifolia (Koenig.) Macb.

Seed kernels yield mahua oil (51·1%). The oil has emollient properties and is used in skin diseases, rheumatism and headache. It is laxative, useful in piles and haemorrhoids, also used as an emetic. The seeds are galactagogue (*J. Bombay nat. Hist. Soc.*, 1954-55, 515).

Mahua cake possesses insecticidal and pesticidal properties; along with shikakai (*Acacia concinna*), it is used as a hairwash also in South India (*Wlth India*, **VI**, 214).

The flowers are used for the preparation of vinegar. By extracting the flowers with hot water, a good quality syrup is obtained, useful in jams and sweetmeats and as a substitute for honey (*J. Indian chem. Soc. industr. Edn*, 1955, 75). The honey obtained is reported to be used for eye diseases.

Mahua flowers are regarded as cooling, tonic and demulcent; used in coughs, colds and bronchitis. They show antibacterial activity against *Esch. coli*.

Fruits on steam distillation yield 0·03% of a volatile oil (*Indian Soap J.*, 1945-46, **11**, 131).

The bark is used for rheumatism, ulcers, itches, bleeding and spongy gums, tonsillitis and diabetes mellitus. It is given to horses for stomachache. The roots are applied to ulcers (*Wlth India*, **VI**, 216).

MAESA (*Myrsinaceae*)

***M. chisia** D. Don.

Assam–*Susi-porma*; Khasi–*Diengaja-sim*; Nepal–*Bilouni*; Lepcha–*Purmokung*.

Roots, bark, branchlets and leaves—insecticidal.

Found from Nepal to Assam up to 2100 m.

***M. ramentacea** Wall.

Assam–*Seketia*; Khasi–*Dieng-soh-eitiar*; Naga–*Lajachio*; Garo–*Bol-jakhandok, Thebeloa*; Visakhapatnam–*Kokkidi*.

The pounded leaves are used as an external application for itches and other skin affections.

Found in Nepal, Bhutan, Assam and north-east Himalayas, Anantagiri Hills (Visakhapatnam) and Andaman Islands.

MAGNOLIA (*Magnoliaceae*)

***M. grandiflora** Linn.

H.–*Andachampa, Him champa*.

The bark—stimulant, aromatic and tonic and reported to be used for malaria and rheumatism.

Essen. oil from the flowers (*J. sci. industr. Res.*, 1957, **16A**, Suppl., 260; GUENTHER, **V**, 383).

Bark contains alks., salicifoline and magnoflorine.

Roots contain alks., salicifoiine and candicine.

Leaves contain 11·8 mg./kg. of carotenes (α-carotene 20%) (*Wlth India*, **VI**, 224).

Plant alcoholic ext. declines blood pressure but has no action on heart, slight acceleration in respiration (*Aptech. Delo*, 1953, **2**, 65). Possesses essen. oil (*Indian J. agric. Sci.*, 1955, **25**, 73).

Native of N. America, cultivated in Indian gardens.

MAHONIA (*Berberidaceae*)

***M. borealis** Takeda

Lushai–*Pualeng*.

Roots contain five alks.: oxycanthine, berberine, neprotine, palmatine and jatrorrhizine (*J. Amer. pharm. Ass.*, 1951, **40**, 36).

Found in North-West India and Lushai Hills at 1500 m.

M. napaulensis DC.

Alk. 'umbellatine' identical with berberine and alk. neprotine with jatrorrhizine [*Proc. Indian Acad. Sci.*, 1958, **47** (A),41].

***M. sikkimensis** Takeda

Three alks. isolated from the stem-bark (*J. Amer. pharm. Ass., Sci. Ed.*, 1951, **40**, 229).

The shrub found in Sikkim at 2100 m. alt.

***M. simonsii** Takeda

Roots contain oxycanthine, berberine, neprotine, palmatine and jatrorrhizine (*J. Amer. pharm. Ass.*, 1951, **40**, 36).

India, Khasi Hills.

MAJORANA (*Labiatae*)

M. hortensis Moench

English–*Sweet marjoram*.

Leaves and flowers, steam-distilled, yield a volatile oil, oil of Sweet Marjoram (0·3-0·4% from fresh). Besides its use in soap, liqueurs and perfumes, it is used as an external application for sprains, bruises and paralytic limbs and toothache and for hot fomentation in acute diarrhoea (*Wlth India*, **VI**, 227).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Sweet marjoram—carminative expectorant and tonic; leaves and seeds are astringent. An infusion of the plant is used as stimulant, emmenagogue and galactagogue; also reported useful in asthma, hysteria and paralysis (STEINMETZ, II, 287).

Leaves and flowering stalks yield an essential oil containing eugenol 6·7%, chavicol 4·6% and α-linalool 30·6% (*Indian Soap J.*, 1955, **21**, 12); (*Riechstoffe Aromen*, 1963, **13**, 61; *Chem. Abstr.*, 1963, **59**, 13705 *g*).

MALLOTUS (*Euphorbiaceae*)

M. philippinensis Muell. Arg.

Kamala powder as oral contraceptive; the anti-fertility factor is rottlerin (*Indian J. med. Res.*, 1960, 52.)

MALPIGHIA (*Malpighiaceae*)

***M. glabra** Linn.

English–*Barbados cherry*.

The fruits are rich in ascorbic acid; considered useful in dysentery, diarrhoea and liver disorders.

Cultivated in gardens for its edible fruits and as a hedge plant in India. Native of tropical America.

***M. punicifolia** Linn.

English–*West Indian cherry*.

Tel.–*Vallari*; Kan.–*Simeyaranelli*.

The plant cultivated for its juicy, pleasantly acid fruits which resemble crab apple in flavour; fruits rich source of ascorbic acid.

Cultivated in gardens in Madras and Mysore.

MALUS (*Rosaceae*)

***M. pumila** Mill. syn. *M. sylvestris* Hort. non-Mill and *Pyrus malus* Linn.

English–*Cultivated apple*.

H. & B.–*Seb, Sev*; Kan.–*Sabu, Sevu*; P.–*Seo*; Ladakh–*Kushu*.

Apples—valuable as antiscorbutic fruits; rich in pectin and are useful in diarrhoea.

Bark of apple trees, particularly root-bark—anthelmintic, refrigerant and hypnotic. Infusion of the bark is given in intermittent, remittent and bilious fevers.

Leaves—contain an antibacterial substance, phloretin (yield 2·4%); it inhibits the growth of a number of Gram-positive and Gram-negative bacteria in as low a concentration as 30 p.p.m. (*Wlth India*, VI, 245).

Sugars constitute 80% of the total carbohydrates of ripe fruits; fructose is the principal sugar (60%) followed by glucose (25%) and sucrose (15%) (*Indian J. Hort.*, 1954, 19). The pectin content of the edible portion varies from 0·14 to 0·96% (as calcium pectate). Asparagine accounts for 50% of the non-protein nitrogen present in mature fruits (*Aust. J. biol. Sci.*, 1953, 369; *Nature, Lond.*, 1954, 588; 1955, 170).

The vitamins present in fresh apples are thiamine, riboflavin, niacin and ascorbic acid (*Hlth Bull.*, 1951, No. 23, 44). Malic acid constitutes the principal acid 0·95% (of the total acids of the fruit), besides citric, lactic and succinic acids.

Cultivated at Srinagar, Kulgam and Uttarmachipura in Kashmir and Udhampur and Kishtwar in Jammu, Almora, Nainital and Garhwal in U.P., Kulu valley in Punjab, Simla Hills in H.P. and Bangalore and Nilgiri Hills in S. India.

MALVA (*Malvaceae*)

M. parviflora Linn.

The plant reported to have produced narcotic poisoning in animals (CHOPRA, 546). It causes 'Pink-white' disease in hen's eggs, due to the presence of malvic acid in the fatty oil from the leaves and seeds. The potassium salt of malvic acid enhances the haemolysis of sheep erythrocytes (*Nature, Lond.*, 1956, 94; 1957, 830).

M. sylvestris Linn.

Flowers give mucins, which on hydrolysing yield D-galactose, L-arabinose, L-rhamnose and D-galacturonic acid (*Pharm. Zentralh.*, 1961, **100**, 14).

MALVASTRUM (*Malvaceae*)

***M. americanum** Torr. syn. *M. spicatum* A. Gray

The plant said to be poisonous to sheep. It contains 0·5-2·5% total oxalate and possibly an alk. (*Chem. Abstr.*, 1954, 14037; *Wlth India*, VI, 251).

Found in various parts of India as weed of cultivation.

MAMMEA (*Guttiferae*)

***M. americana** Linn.

English–*Mammey apple*.

Seeds—bitter, resinous and highly toxic to several pests, i.e. cockroaches, mosquitoes and flies. An infusion in water effective against lice and flea; that of the fruit pulp as effective as 1% DDT (*Wlth India*, VI, 252).

Native of West Indies and widely cultivated elsewhere including India.

***M. longifolia** Planch. & Triana syn. *Ochrocarous longifolius* Benth. & Hook. f.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

H.–*Nagkesar*; B.–*Nagesar*; M.–*Punnag*; G.–*Ratinagkesar*; Tel.–*Suraponna*; Tam.–*Nagappu*; Kan.–*Wundi, Suragi*; Mal.–*Seraya*; Oriya–*Churiana*.

Flower buds—stimulant, carminative and astringent; used in dyspepsia and haemorrhoids.

Found in evergreen forests in Western India from Khandala to Malabar and Coimbatore, up to 600 m. alt.

MANDRAGORA (*Solanaceae*)

M. officinarum Linn. syn. *M. autumnalis* Spreng.

English–*Devil's apple*; *Satan's apple*.

The roots possess properties similar to those of belladonna.

Drug—sedative, hypnotic, mydriatic and anaesthetic. In Patna it is used as a narcotic.

The roots contain alks., hyoscyamine, hyoscine, ψ-hyoscyamine, cuscohygrine and mandragorine (*Nature, Lond.*, 1954, 833; *Wlth India*, **VI**, 253).

MANGIFERA (*Anacardiaceae*)

M. indica Linn.

Dried flowers—astringent; given for diarrhoea, chronic dysentery, catarrh of the bladder and gleet.

Flowers yield 0·04% of an essen. oil (*Perfum. essent. Oil Rec.*, 1961, 156). Pannicles give ethyl galate by alcohol extraction (*J. sci. industr. Res.*, 1961, **20B**, 296).

Bark—astringent, used in diphtheria and rheumatism; it has tonic action on the mucous membrane (*Chem. Abstr.*, 1959, 22264). Mangiferin has been isolated from the bark.

Gum—used as a substitute for gum arabic; in dressings for cracked feet and for scabies, also considered antisyphilitic (*Wlth India*, **VI**, 281).

The exts. of leaves, bark and stems and unripe fruits exhibit moderate antibacterial activity against *Micrococcus pyrogenes* var. *aureus*. Antifungal microorganisms reported in ripe mango (*J. sci. industr. Res.*, 1955, **14C**, 126). Use of decoction of leaves, bark, gum, flowers, fruits and seeds in medicine (*Poona agric. Coll. Mag.*, 1961, **52**, 52).

Seed kernel—astringent taste, free from toxic principles; contains amino acids (*Sci. & Cult.*, 1953-54, 158). Kernel powder used as anthelmintic and in bleeding piles (*Proc. Indian Acad. Sci.*, 1951, 288). Seed fat, its glycerides structure (*J. sci. industr. Res.*, 1962, **21B**, 400).

Roots give mangiferin, friedelin and β-sitosterol (*Indian J. Chem.*, 1964, **2**, 378).

MANIHOT (*Euphorbiaceae*)

M. esculenta Crantz syn. *M. utilissima* Pohl

English–*Tapioca*.

Indian Bazaars–*Cassava*; Tel.–*Karrapendalmu*; Tam.–*Maravalli kizhangu*; Kan.–*Maragenasu*; Mal.–*Marachini kizhangu, kappa*; Assam–*Simal alu*.

Cassava—the staple food of the poorer section. It is consumed like sweet potato in the form of tubers, chips, flour and sago. Under the name Cassava Rice, dried pellets made from the tuber juice, used as a substitute for rice and maize. The starch content of the tuber varies from 77·5 to 88·5%.

Protein contents of the tubers (*Indian J. med. Res.*, 1951, 332; 1956, 501). The juice of fresh tubers contains phosphorylase, Q-enzyme, pyro- and glycero-phosphatases (*J. sci. industr. Res.*, 1954, **13B**, 223; *Bull. cent. Food tech. Res. Inst.*, 1955-56, 193).

Tapioca starch and *suji*—prepared from peeled tubers as a substitute for wheat *suji* (*Rep. Marketing Tapioca*, 1955, 26, 28, 30). Tapioca sago (*Rep. Marketing Tapioca*, 1955, 12, 22; *Sci. & Cult.*, 1959-60, 343). Liquid glucose from the cassava starch conforms to liquid glucose (*Acta med. philipp.*, 1951, 43; *Chem. Abstr.*, 1953, 269 *c*).

Tapioca macaroni—a blend of tapioca flour, groundnut flour and wheat semolina, developed at the C.F.T.R.I., Mysore. The finished product appears like undermilled rice and contains about twice as much protein as rice (*Bull. cent. Fd technol. Res. Inst., Mysore*, 1954, 199; *Food Sci.*, 1958, 87).

Diurnal variations in tapioca leaves in some enzymes of carbohydrate metabolism [*Plant Physiol.*, 1952, **37**(3), 283].

A native of S. America, cultivated throughout the humid tropics. In India, it is grown in Kerala as a subsidiary food crop and as an excellent raw material for sago manufacture.

MANILKARA (*Sapotaceae*)

***M. hexandra** (Roxb.) Dubard syn. *Mimusops hexandra* Roxb.

H.–*Khirni*; B.–*Khirkhejur*; M.–*Ranjana*; *Raini*; G.–*Rayan, Khirni*; Tel.–*Manjipala*; Tam. & Mal.–*Palla*; Kan.–*Bakula*; Orissa–*Khirakuli*.

Bark is used in fevers and as a general tonic. Seed oil is demulcent and emollient (*Wlth India*, **VI**, 300).

Seeds yield an edible oil (24·6%), known as Rayan oil. The fatty acid composition: palmitic acid, stearic acid, lignoceric acid, oleic acid and linoleic acid (*J. Indian Inst. Sci.*, 1924, **7**, 71;

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Fette Seifen. Anstr-Mittel, 1961, **63**, 711).

Found in central India and the Deccan. Cultivated throughout the greater part of India.

MARANTA (*Marantaceae*)

M. arundinacea Linn.

Arrowroot starch—yield 15% on the weight of rhizomes. Valued as food especially for infants, invalids and convalescents. Employed in the preparation of biscuits, cakes, puddings and jellies (U.S.D., 1955, 1748; B.P.C., 1959, 57).

MARRUBIUM (*Labiatae*)

M. vulgare Linn.

Isolation of marrubin, 17·7 g. from 2·8 kg. of herb (*Pharm. Zentralh.*, 1957, **90**, 103; *Biol. Abstr.*, 1958, 38570). Isolation of marrubin, a sterol and a sesquiterpene (*J. pharm. Sci.*, 1964, **53**, 845; *Chem. Abstr.*, 1964, **61**, 11849 *e*).

MARSDENIA (*Asclepiadaceae*)

***M. tenacissima** Wight & Arn.

H.–*Jiti, Chiti, Tongus*; B.–*Chiti, Jiti*; Tel.–*Karudushtu-patige*; Oriya–*Gha*; Dehra Dun–*Marua-bel*; Nepal–*Bahunilahara, Sunamarai*; Lepcha–*Kamtiongrik*; Central India–*Babaljak*.

The root is used by Mundas as a remedy for colic. Recently, it has been claimed that the roots of this plant constitute the drug white turpeth (*safed nosoth*) of the Indian market.

The drug is a well-known purgative in Indian medicine and according to some is obtained from the roots of *Operculina turpethum* (Linn.). *Silva manso* syn. *Ipomoea turpethum* R. Br. (*Indian J. Pharm.*, 1960, 283, 284; *Indian For. Leafl.* No. 70, 1944).

Found in the Himalayas from Kumaon to Assam up to 1500 m. alt. and extending southwards to the Deccan Peninsula.

MARSILEA (*Marsileaceae*)

***M. minuta** Linn.

A common fern, popular drug in folk medicine. Leaves and whole plant used for sedation and insomnia; marsiline, a macrocyclic ketone, of sedative and convulsant properties, isolated (*Sci. & Cult.*, 1963, **29**, 619).

MATRICARIA (*Compositae*)

M. chamomilla Linn.

English–*German chamomile*.

The active constituent of the volatile oil (oil of German chamomile) contains chamazuline to which is attributed the antiphlogistic action of the drug. Chamazulene has been used as an antihistaminic in allergic patients. The spasmolytic effect of the drug ascribed to apigenin or to apiin and to methoxycoumarin (*Chem. & Ind.*, 1954, 604; 1956, 1234; *Chem. Abstr.*, 1952, 10459). Characteristic of essen. oil of plant [*Labo-Pharm.*, 1959, **7**(70), 17; **7**(71), 23; *Biol. Abstr.*, 1961, 73918].

Essen. oil (*Bull. Galenica*, 1953, **16**, 155; *Chem. Abstr.*, 1955, 8560; *Sci. pharm.*, 1953, **21**, 282; *Chem. Abstr.*, 1955, 12782 *e*). Maximum yield of oil and its azulene contents at full flowering (*Arch. Pharm. Berl.*, 1956, **289**, 200; *Chem. Abstr.*, 1956, 14176 *i*). Leaves and stems yield 0·9% of oil but no azulene; the anthodia yield 0·8-1·15% of oil of which 14-18% is azulene (*Arch. pharm. Berl.*, 1956, **289**, 681; *Biol. Abstr.*, 1958, 24704). Anthodia distilled from glycerine containing 1% of ascorbic acid, highest yield of oil and azulene (*Sci. pharm.*, 1954, **24**, 155; *Biol. Abstr.*, 1958, 29499). Azulene determination in the oil (*C.R. Acad. bulg. Sci.*, 1956, **9**, No. 3, 33; *Chem. Abstr.*, 1957, 18481 *h*; *J. sci. industr. Res.*, 1957, **16A**, Suppl. 26). In Poland, the herb yields oil 0·46-0·67% with azulene contents from 4·52 to 7·95% (*Biul. Inst. Rosl. leczn.*, 1958, **4**, 186; *Chem. Abstr.*, 1959, 9581 *d*). Essen. oil, yield 0·36-0·81%, gave chamazulene in 2·80 to 14·22% in different samples, no relation between the oil and azulene contents; some oil-poor drugs were rich in azulene (*Pharmazie*, 1960, **15**, 500). Variation in oil contents and chamazulene contents in wild and cultivated plants [*Cslka. Farm.*, 1964, **13**(2), 64; *Chem. Abstr.*, 1964, **61**, 11844].

MATTHIOLA (*Cruciferae*)

M. incana R. Br.

The seeds contain mucilage, a fatty oil, two crystalline colouring matters and a volatile oil (*Acta chem. scand.*, 1953, 1267; 1955, 542; *Proc. nat. Acad. Sci. India*, 1958, **27A**, 165, 253; *J. Amer. Oil Chem. Soc.*, 1961, 297; *J. Indian chem. Soc.*, 1961, 933).

***M. tristis** R. Br.

Seed exts. contain mustard oil compds., sinapine, MeNCS, iso-Pr NCS and a glucoside of sulphoraphenol as determined by paper chromatography (*Farmacognosia*, 1960, **20**, 307).

Found in Mediterranean region, and cultivated in Indian gardens.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

MEDICAGO (*Leguminosae*)

***M. hispida** Gaertn. syn. *M. denticulata* Willd.

English–*Toothed bur clover, Toothed medick.*

B. & P.–*Maina*; Delhi–*Maina, Chandaust.*

Feeding on bur clover causes bloating in some animals. In Australia, the plant is reported to have caused photosensitization and dermatitis of the skin, particularly when fed on mature plant (*Wlth India*, **VI**, 312).

Leaves rich in ascorbic acid (850 mg./100 g.) and β-carotene (51 mg./100 g.); along with photosensitizing agents.

Found in Punjab, Kumaon, Upper Gangetic Plain, North Bengal and Madras.

***M. lupulina** Linn.

English–*Black medick, Hop clover, Yellow trefoil.*

The plant possesses lenitive properties. Aq. exts. show antibacterial activity against microorganisms.

Found in Punjab, Kumaon and Upper Gangetic Plain, Bihar and North Bengal.

***M. minima** Linn.

English–*Little bur clover, Small medick.*

The plant is suspected to cause photosensitization of sheep in Australia (*Bull. Coun. sci. industr. Res. Aust.*, 1948, No. 232, 90).

Found in Kashmir at 1500-1800 m. alt.

***M. sativa** Linn.

English–*Lucerne, Alfalfa.*

H.–*Wilaytigawuth, Lasunghas*; Ladakh–*Hol*; P.–*Lusan.*

Lucerne highly valued as fodder; a valuable source of vitamins A and E. Fresh lucerne is rich in vitamin C. The enzymes reported are amylase, emulsin, invertase and pectinase. Miscellaneous constituents present are toxic saponins (0·5-2%), an alk. *l*-stachydrine (0·14%) and two ketones, myristone and alfalfone. The leaves contain β-methyl-D-glucoside (*Nature, Lond.*, 1962, 1101).

Lucerne leaf meal, prepared mainly from leaves (contains over 20% proteins), is used in U.S.A. as a vitamin A supplement in rations for poultry, hogs, dairy calves and horses. Non-protein nitrogen compds. (amides) in fodder; histide identified in the ext. [*Ann. Univ. M. Curie-Sklodowska*, 1958, **13** (16), 269; *Biol. Abstr.*, 1961, 21680, 21681].

Seeds give a new alk.(−)-homostachyrine (*Canad. J. Chem.*, 1958, **38**, 339; *Biol. Abstr.*, 1958, 28448).

Cultivated in India. It is a very variable herb. The cultivated form arose in western Persia, whence it has spread to almost all the countries of the world.

MELALEUCA (*Myrtaceae*)

M. leucadendron Linn.

English–*Cajuput tree.*

Essen. oil (*Bull. agric. Congo belge*, 1963, **44**, 1, 319; *Chem. Abstr.*, 1954, 956 *i*). Essen. oil from 3 other species *M. laterifolia* Benth., *M. rhaphiophylla* Schan. and *M. unicinata* R. Br. (*J. Proc. Aust. chem. Inst.*, 1950, **17**, 398; *Chem. Abstr.*, 1951, 3660 *d*).

MELIA (*Meliaceae*)

M. azedarach Linn.

Contains bakalactone, a liq. product. Aq. ext. reduces intensity of asthmatic attack (*J. sci. industr. Res.*, 1964, **13B**, 740).

Anthelmintic constituents of the cortex give vanillic acid and *d,l*-catechin [*J. Osaka Cy med. Cent.*, 1960, 9(2), 441, 445; *Biol. Abstr.*, 1961, 28627, 28632].

Leaves have significant anthelmintic activity (*J. Indian med. Ass.*, 1963, **41**, 435).

MELILOTUS (*Leguminosae*)

M. officinalis Lam.

The seeds reported to be poisonous to horses (*J. Bombay nat. Hist. Soc.*, 1954-55, 515).

Plant ext. contains coumarin (0·9%), and hydrocoumarin (0·2%) in addition to flavones. The mixture has a favourable influence on blood circulation in the tissues (*Med. Mschr.*, 1960, **14**, 589; *Chem. Abstr.*, 1960, 23191 *i*).

MELOCANNA (*Gramineae*)

***M. bambusoides** Trin.

H.–*Muli, Metunga, Bish*; Assam–*Tarai, Wati.*

Activated charcoal of high absorbing power prepared from it. The culms contain abundant amounts of a secretion known commonly as *tabasheer*, used in medicine (*Wlth India*, **I**, 145).

An arborescent bamboo found in Assam hills.

MELODINUS (*Apocynaceae*)

M. monogynus Roxb.

The leaves, wood and root contain a narcotic poison. The plant is locally used as an antimalarial drug (*Wlth India*, **VI**, 335).

Root bark yields a saturated sterol, monogynol A; an unsaturated sterol,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

monogynol B; a β-glucoside, melodin and crude melodinin (*J. sci. industr. Res.*, 1954, **13B**, 546). Identn. of monogynol A, possessing a lupeol skeleton and monogynol B, identical with lupeol (*J. sci. industr. Res.*, 1959, **18B**, 263).

MELOTHRIA (*Cucurbitaceae*)

***M. indica** Lour.

Juice of leaves applied in sores of thrush and is used in the treatment of eye diseases in Moluccas.

The fruit possesses purgative properties.

Found in Tehri-Garwal, Sikkim, Assam and Naga Hills.

MENTHA (*Labiatae*)

Components of essen. oil of 84 spp. of *Mentha* produced in Japan (*Koryo*, 1963, No. 72, 25; *Chem. Abstr.*, 1964, **60**, 363 *a*). Essen. oil [*Perfum. essent. Oil Rec.*, 1964, 55(5), 323].

Carvone containing spp.: **M. longifolia** Huds, **M. rotundifolia** (Linn.) Huds, **M. spicata** Linn.

Carvone absent spp.: **M. aquatica** Linn., **M. arvensis** Linn., **M. verticillata** (arvensis), **M. piperita** Linn., **M. pulegium** Linn. (*Ber. Schweiz. bot. Ges.*, 1953, **63**, 90; *Chem. Abstr.*, 1954, 11733 *d*).

M. aquatica Linn.

The herb yields 0·8% of essen. oil consisting of esters (as menthyl acetate) 22·41%, free alcohol (as menthol) 28·53% and ketone (as menthone) 0·77%. Menthofuran is the major constituent (40%); piperitone, menthone and pulegone present (*Wlth India*, **VI**, 338). Menthafuran [*J. Amer. pharm. Ass., Sci. Ed.*, 1958, **47**(4), 285].

M. arvensis Linn.

Essen. oil, equal to the oil from *Piperita* species (*Indian Soap J.*, 1953, **19**, 44); the oil (yield 0·82%) contains chiefly pulegone and *d*-isomenthone (*Riv. ital. Essenze Profumi*, 1954, **36**, 120; *Chem. Abstr.*, 1954, 9625 *c*); no variety of the plant yields oil of 75% carvone content, as required in the Indian Pharmacopoeia (*Indian J. Pharm.*, 1956, **18**, 291). Constituents of the oil [*Indian J. Pharm.*, 1956, **18**, 421; *Parfum. Kosmetik*, 1963, **44**(4), 93; *Chem. Abstr.*, 1964, **60**, 4970 *h*]. Essen. oil 0·90% yield, its physico-chemical examination (*Perfum. essent. Oil Rec.*, 1964, 323). Oil from plants in Bhabar and Tarai (*Indian Perfumer*, 1963, **17**, 17); from plants grown in Kashmir 1·90% yield (*Riechstoffe Aromen*, 1964, **14**, 2).

A new source of linalool (*Zesz. nauk. Politech. Lodz, Chem. Spozywcza*, No. 5, 1961, 23; *Chem. Abstr.*, 1964, **61**, 1702 *h*).

Detection and estimation of menthofuran in mint oil [*J. pharm. Sci.*, 1964, **53**(9), 1008; *Chem. Abstr.*, 1964, **61**, 14462 *g*].

M. arvensis Linn. subsp. *haplocalyx* Briq. var. *piperascens* Holmes

English–*Japanese mint.*

Essen. oil, known in the trade as Japanese mint oil or Japanese peppermint oil; yield from 1·28 to 1·6% in Japan. Leaves in Jammu, yield 2% while from U.P. it is 0·45% (*Wlth India*, **VI**, 340). This oil is used as a substitute for true peppermint oil (from *M. piperita*).

Introduced from Japan and cultivated in Jammu and Kashmir at an alt. of 270-1500 m.

M. arvensis Linn. var. **Jawarancusa**

Essen. oil from plants growing in Kashmir, yield 1·9% (*Indian Oil Soap J.*, 1963, **29**, 33).

M. arvensis × M. longifolia

Essen. oil yield 1·40% (*Perfum. essent. Oil Rec.*, 1964, 323).

M. arvensis × M. piperita

Essen. oil yield 0·2% (*Perfum. essent. Oil Rec.*, 1964, 323).

M. cordifolia Ophiz

Essen. oil yield 0·65% (*Perfum. essent. Oil Rec.*, 1964, 323).

M. dumetorium Schult.

Essen. oil yield 0·40%; its physico-chemical examination (*Perfum. essent. Oil Rec.*, 1964, 323).

M. longifolia Huds syn. *M. incena* Willd; *M. sylvestris* Linn.

Essen. oil from wild mint, yield 0·57%, contains phenols and aldehydes, and pineol and menthol (*Vest. Akad. Nauk kazakh. SSR*, 1948, **5**, 28); *Chem. Abstr.*, 1952, 1718 *a*; *Perfum. essent. Oil Rec.*, 1964, 55, 178, 183).

Plants naturalized in Brazil, contain essen. oil with 3% pulegone and 55·18% menthol (*Rev. Flora med.*, 1950, **17**, No. 2/3, 51; *Chem. Abstr.*, 1954, 8485 *f*). Composition of the essen. oil [*Trudy Khim. Prirod. Soedinenii, Kishinev. Gosudarst. Univ.*, 1959, No. 2, 35; *Chem. Abstr.*, 1962, 5521*i*; *Parfum. Kosmetik*, 1964, **45**(8), 217; *C.R. Acad. bulg. Sci.*, 1964, **17**(5), 483; *Chem. Abstr.*, 1964, **61**, 15927 *a*].

New constituents, diospherol, piperitenone oxide, diosphenolene, piperitone, piperitenone, limonene and cineol identified [*J. Amer. pharm. Ass., Sci. Ed.*, 1958, **47**(4), 285].

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

***M. mulleriana** Sch. Bip.
Essen. oil 1·70% yield, its physico-chemical examination (*Perfum. essent. Oil Rec.*, 1964, 323).

***M. niliaca** Jacq. var. **alpecuroides**
Essen. oil 1·30% yield, its physico-chemical examination (*Perfum. essent. Oil Rec.*, 1964, 323).

M. piperita Linn.
Composition of oil: methyl acetate 20%, menthyl acetate 55·8%, menthol 9·1%, menthone and hydrocarbons 15% (*Indian J. Pharm.*, 1957, **19**, 74).
Statistical methods for evaluating total menthol and menthone contents in mint oil [*Farmacognosia*, 1955, **15**(37), 261; *Biol. Abstr.*, 1957, 22408]. Identn. of menthofuran in Rumanian oil [*Farmacia, Buc.*, 1964, **12**(9), 535; *Chem. Abstr.*, 1964, **61**, 15934 *h*].
Soaking seedlings in amido-α-naphthyloacetic acid solution increases oil content from 29 to 46%, menthol content from 4·5 to 9% [*Roczn. Nauk roln. Ser. A.*, 1956, **74**(1), 111; *Biol. Abstr.*, 1959, 7392]. Essen. oil content varies with rise and fall of temperature with simultaneous increase of menthol up to 69·9% (*Acta polon. pharm.*, 1953, **10**, 169; *Chem. Abstr.*, 1954, 5445 *f*); cultivation possibility in U.P. (*Indian Soap J.*, 1951, **17**, 43). Highest content of oil in plant and of menthol in oil was in 50% flowering phase (*Chem. Abstr.*, 1964, **61**, 529 *g*).

M. piperita var. **officinalis**
English–*White mint.*
Essen. oil components [*Parfum. Kosmetik*, 1964, **45**(8), 216].

M. piperita var. **vulgaris** Sole.
Essen. oil [*Proc. nat. Acad. Sci. India*, 1963, **33(A)**, 317; *Chem. Abstr.*, 1964, **60**, 362 *f*].

***M. pulegium** Linn.
English–*Pennyroyal.*
Essen. oil—pulegone contents 80% (*Not. farm., Porto*, 1952, **18**, 166; *Chem. Abstr.*, 1953, 6094 *f*). Essen. oil in plants raised in Jammu & Kashmir, yield 0·9% (*Indian Oil Soap J.*, 1964, **30**, 41).
Racemic menthol by reduction of D-pulegone from menthol oil (*Dissnes pharm., Warsz.*, 1959, **11**, 257; *Biol. Abstr.*, 1960, 42572). The 'pulespenone' from mentha oil is piperitone (*Bull. Soc. chim. Fr.*, 1963, 681; *Chem. Abstr.*, 1964, **61**, 6191 *g*).
Found in Europe and around Mediterranean region; introduced into India.

***M. rotundifolia** (Linn.) Huds
Essen. oil—a new ketone, rotundifolone (*Koryo*, 1957, No. 44, 20; *Chem. Abstr.*, 1958, 11362); from a French strain, a new alcohol (+)-neoisopulegol (*Perfum. essent. Oil Rec.*, 1960, **51**, 657); European strains (excepting French) identical in essen. oil with that of Japan and America [*Bull. agric. chem. Soc. Japan*, 1958, **22**, 201; *Chem. Abstr.*, 1958, 20907 *d*; 1960, 324; *Biol. Abstr.*, 1960, 60755].
Native of Europe and cultivated in Indian gardens.

M. spicata Linn. syn. *M. viridis* Linn.
Essen. oil—similar to Russian and Sicilian, but different from American and German (absence of carvacrol), mint-like and burning taste (*R.C. Semin. Sci. Cagliari.*, 1952, **22**, 69; *Chem. Abstr.*, 1954, 7262 *i*); yield 80 kg. per hectare with carvone contents 66·9-68·7% (*Riv. ital. Essenze Profumi*, 1954, **36**, 8; *Chem. Abstr.*, 1954, 9624 *i*); oil from two hybrids of mentha possesses carvone content 64·4 and 50·06% (*Chem. Abstr.*, 1954, 9629 *b*). Kanpur sample of oil (yield 0·2-0·25%) contains limonene and dipentene 17·5%, *l*-carvone 55·3%, dihydrocarveol 6·74% and esters 11·55% (*Indian Perfumer*, 1957, **1**, 21). Kashmir sample [*Indian J. agric. Sci.*, 1955, **25**, 73; *Parfum. Kosmetik*, 1963, **44**(4), 123; *Chem. Abstr.*, 1964, **60**, 4970 *h*].

***M. verticillata** D. Don
Essen. oil, yield 0·45%—its physico-chemical examination (*Perfum. essent. Oil Rec.*, 1964, 323).

MERIANDRA (*Labiatae*)

M. bengalensis Benth.
Essen. oil—yield 0·40-1·25%; camphor content 5·9-70·5%, cineole content 9·7-24·2% by volume and density of 0·9063-0·9746 (*Riv. ital. Essenze Profumi*, 1955, **37**, 141; *Chem. Abstr.*, 1955, 11245 *e*).

MERREMIA (*Convolvulaceae*)

***M. hastata** (Desr.) Hallier f. syn. *M. tridentata* subsp. *hastata* var. *Coststt.*
Mal.–*Cheruvayera*; Tam.–*Tala-neli*; Tel.–*Konda, Sita savaram.*
A poultice of leaves is applied to the head for fever in Malaya. A decoction of roots is used as a mouthwash for toothache.
Found in Upper Gangetic Plain, West Bengal, Khasi and Jaintia Hills, Orissa, Deecan and Rajasthan.

***M. mammosa** (Lour.) Hallier f. syn. *Ipomoea gomezii* C. B. Clarke
The tubers are used locally in the treatment of diabetes and in affections

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of throat and respiratory organs; they are mildly purgative (*Wlth India*, VI, 349).

Found in Lakhimpur (Assam) and Andaman Islands.

M. tridentata subsp. *hastata* var. *Ooststr*; see **M. hastata** (Desr.) Hallier f.

***M. tridentata** (Linn.) Hallier f. syn. *Ipomoea tridentata* Roth.

S.–*Prasarini*; Tam.–*Mudiyakunthal, Thirippan pullu, Savulikodi*; Mal.–*Prasarini, Talanili*; Mundari–*Daru jamjuri*.

Plant—bitter, astringent, calefacient and tonic and used in the treatment of rheumatism, hemiplegia, piles, swellings and urinary disorders (decoction of root has similar uses) (*Wlth India*, VI, 47).

Found in Upper Gangetic Plain, Bihar, Orissa, West Bengal, S. India, Deccan and Gujarat.

M. tuberosa (Linn.) Rendle; see **Ipomoea tuberosa** (Linn.) non Lour.

***M. umbellata** (Linn.) Hallier f. subsp. *orientalis* (Hallier f.). Ooststr syn. *Ipomoea cymosa* Roem. & Schult.

B.–*Sapussumbu*; Tel.–*Catukattutivva, Kappativva, Verundale*; Tam.–*Kolavarvalli*; M.–*Kolavara valli*; Assam–*Goria loti, Kolia*; Garo–*Sithribodu*; Lushai–*Voktesentil*; Oriya–*Paninoi*; Santal–*Karmbi arak*.

The plant is considered useful in Indonesia for fistulas, pustules and tumours. A poultice of leaves is used as external application for burns, scalds and sores.

Seeds contain a mucilage and used as an aperient and alterative in cutaneous disease (*Wlth India*, VI, 348).

MESEMBRYANTHEMUM (*Aizoaceae*)

***M. crystallinum** Linn. = **Cryophytum crystallinum** (Linn.) N.E.Br.

English–*Ice plant*.

Plant—demulcent and diuretic and used in inflammations of pulmonary and genito-urinary mucous membrane.

Leaves—used in ascites, dysentery and diseases of the liver and kidney (*Wlth India*, VI, 349); reported to contain a saponin and an alk., mesembrine.

Native of South Africa, grown in Indian gardens for its foliage.

MESUA (*Guttiferae*)

M. ferrea Linn.

Antibiotic activity of mesuol, mesuone and kernel and shell oils [*Proc. nat. Inst. Sci. India, Ser. B. Biol. Sci.*, 1959, **25**(1), 8]. Amino acids of Nahor seed oil cake (*Curr. Sci.*, 1964, 16).

MICHELIA (*Magnoliaceae*)

M. champaca Linn.

Flowers from South Orissa yield essen. oil 0·064-0·068% (*Ather. Ole.*, 1953, **3**, 99; *Chem. Abstr.*, 1953, 8323 *d*). Essen. oil of fruit rinds (*Perfum. essent. Oil Rec.*, 1963, **54**, 817).

Alks. of the plant (*Yakugakuzasshi*, 1963, **83**, 216; *Chem. Abstr.*, 1963, **59**, 3974 *e*).

MICROMERIA (*Labiatae*)

***M. biflora** Benth.

English–*Indian wild thyme*.

Mundari–*Ote budu ba*.

Plant—aromatic; reported to be used by Mundas as an application for worm-infested wounds of cattle.

Volatile oil (yield 0·41-1·21%) (*Indian Perfumer*, 1952, **7**, 105; *Chem. Abstr.*, 1952, 11585 *g*).

Found in tropical and temperate Himalayas from Kashmir to Bhutan and in Punjab (Gurdaspur), Bihar, N. Circars, Western Ghats and hills of South India.

M. capitellata Benth.

Bo.–*Karvat*; Santal–*Burupudina*; Mundari–*Pirilajauni ba*.

MICROTOENA (*Labiatae*)

***M. insuavis** (Hance) Prain ex Dunn syn. *M. cymosa* Prain; *Plectranthus patchouli* C. B. Clarke

Known as patchouli of Assam or Khasia; smells strongly of patchouli from *Pogostemon heyneanus* Benth. (Bombay Patchouli) (*Perfum. essent. Oil Rec.*, 1960, 484).

Found in Tripura, Assam, Manipur, Khasi and Nagaland.

MIKANIA (*Compositae*)

***M. cordata** (Burm.) B. L. Robinson syn. *M. scandens* Hook. f. (Fl. Br. Ind.) non Willd.

It is a rich source of vitamins A and C; also contains vitamin B. Leaves used in Malaya for itches and in Java and S. Africa for poulticing wounds (Burkill, 1470).

A weed found in West Bengal, East Assam, Aka Hills and probably S. India.

MILIUSA (*Annonaceae*)

***M. tomentosa** (Roxb.) J. Sinclair syn. *Saccopetalum tomentosum* Hook. f. & Thoms.

H.–*Kari, Kirua*; M. & Guj.–*Hoom, Humba*; Tel.–*Chilkadudu*; Tam.–

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Periuvay; Kan.–*Hessare, Wumb*; Oriya–*Patmossu, Gandhapalsa*.

The tree yields a pale-yellow gum, known as *Karee gum*, a substitute for tragacanth.

Found from the sub-Himalayan tracts of U.P. and Nepal Terai southwards, throughout the greater parts of India.

***M. velutina** Hook. f. & Thoms.

H.–*Dom-sal, Kari, Gidar rukh*; Tel.–*Pedda-chilka, Duduga*; Mal.–*Kanakaitha, Viluni*; Oriya–*Ganda pulas*; Bihar–*Ome*; Garo.–*Bor samphol*.

The bark is said to possess purgative properties (BURKILL, 1470).

Found in the sub-Himalayan tract and north-east and central India, eastern coast of Deccan Peninsula and Travancore.

MILLETTIA (*Leguminosae*)

M. extensa Benth. ex Baker; see **M. auriculata** Baker ex Brand.

M. pachycarpa Benth.

Exts. and aq. suspension of finely ground seeds used in sprays against house-flies, bean aphidst, etc.; they act as a stomach and contact poison. They are also ovicidal (*J. sci. industr. Res*,. 1954, **13A**, 31; 1955, **14C**, 169; *J. Sci. Fd Agric*., 1950, **1**, 276; *J. sci. industr. Res*., 1956, **15C**, 106).

***M. piscidia** Wight

Khasi–*Dieng-sohlynthein*.

The bark and flowers are used as fish poison.

Found in Sikkim and Assam hills.

***M. racemosa** Benth.

H.–*Jungi*; Tel.–*Galuga*.

The root is used as fish poison; applied on cattle sores to kill vermin (*Wlth India*, VI, 379).

Found in the Deccan Peninsula.

MILLINGTONIA (*Bignoniaceae*)

***M. hortensis** Linn. f.

English–*Indian cork tree*.

H.–*Neem-chameli, Akas nim*; B.–*Corkgach*; M.–*Kavala-nimb, Nimichambeli*; Tel.–*Kavuki*; Tam.–*Maramalli*; Kan.–*Beratu*; Mal.–*Katesam*; Oriya–*Bakeni, Redli, Mach-mach; Sitahara*.

The bark contains a bitter substance and tannin; it is used as an antipyretic in Indonesia.

Cultivated throughout India.

MIMOSA (*Leguminosae*)

M. pudica Linn.

English–*Sensitive plant*.

An adrenaline-like substance identified in the exts. of leaves (*Boll. Soc. ital. Biol. sper*., 1947, 605; *Chem. Abstr*., 1949, 3475 *h*). Composition of the mucilage from the seeds (*J. Indian chem. Soc*., 1956, 864).

MIMULUS (*Scrophulariaceae*)

***M. moschatus** Dougl.

English–*Musk plant*.

The plant is used as a substitute for musk; possesses stimulant properties.

Native of America, found growing in some South Indian hill stations.

***M. strictus** Benth. syn. *M. gracilis* Hook. f. non R. Br.

The plant is used as a remedy in menstrual disorders (WATT & BREYER-BRANDWIJK, 170).

Found along streams, moist, shady places and banks of rice fields in the plains of North India.

MIMUSOPS (*Sapotaceae*)

M. elengi Linn.

Essen. oil (*Perfum. essent. Oil Rec*., 1954, **45**, 80).

M. hexandra Roxb.; see **Manilkara hexandra** (Roxb.) Dubard

MITRAGYNA (*Rubiaceae*)

***M. parvifolia** (Roxb.) Korth. syn. *Stephegyne parvifolia* Korth.

H.–*Kaim, Kalmi*; *Kadassa*; B.–*Gulikadam*; M.–*Kalamb, Kuddam*; Tel.–*Nirkadambe*; Tam.–*Chinna kadambu*; Trade–*Kaim*.

The bark and root are used for fever and colic (KIRT. & BASU, II, 1256).

Throughout the greater part of India, up to 1200 m. in the outer Himalayas.

***M. rotundifolia** (Roxb.) Kuntze syn. *M. diversifolia* Korth; *Stephegyne diversifolia* Hook. f.

Assam–*Timi*; Lushai–*Thianglung, lungkhup*; Trade–*Binga*.

Leaves and bark yield alks. mitraversine, rhyncophylline or mitrinermine, rotundifoline and mitragynol. Rhyncophylline lowers blood pressure and paralyses sympathetic nerve endings (*J. chem. Soc*., 1950, 867).

Found in the hills of Assam up to 1500 m. alt. and in the Andaman Islands.

MOLLUGO (*Ficoidaceae*)

M. oppositifolia Linn. syn. *M. spergula* Linn.

Leaves by ethanolic extn. yield spergulagenin A, a saturated triterpenoid sapogenin, trihydroxy-ketone (*Indian J. Chem*., 1964, **2**, 339).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

MOMORDICA (*Cucurbitaceae*)

M. charantia Linn.

Fruits, leaves and roots are used in Ayurvedic medicines for a number of diseases including diabetes mellitus. Some observations on hypoglycemic activity (*Indian J. med. Res.*, 1960, 471).

The powdered fruit is said to be useful in healing wounds, psorous, intractable and malignant ulcers, a property attributed to the presence of proteolytic enzymes. Chem. compn. of the fruit (*Indian J. Pharm.*, 1961, 128).

M. cochinchinensis Spreng.

Roots contain a triterpenoid saponin. Alcoholic exts. yield a sterol, bessisterol, identical with spinasterol (*Wlth India*, **VI**, 411).

Seeds—used as aperient and in the treatment of ulcers, sores and obstructions of liver and spleen.

Fruits and leaves—external application for lumbago, ulceration and fracture of bones.

In Hong Kong the plants are used as an alterative, bitter drug in place of strychnos.

MONOTROPA (*Monotropaceae*)

***M. uniflora** Linn.

English–*Indian pipe*.

Roots considered sedative, nervine tonic and antispasmodic.

The plant contains a bitter toxic principle (WEHMER, II, 906). Stem exts. active against Gram-positive bacteria (*Econ. Bot.*, 1959, 281).

Only species found in India in the temperate Himalayas and Khasi Hills at 1800-2499 m.

MORINA (*Dipsacaceae*)

***M. longifolia** Wall.

The plant is used as an incense, in the preparation of *dhup*, agarbatties, etc. It yields 0·34% of an essen. oil (*J. sci. industr. Res.*, 1958, **16A**, Suppl. 18). Roots yield essen. oil 0·34% (*Perfum. essent. Oil Rec.*, 1964, 178).

Found in temperate and alpine Himalayas from Kashmir to Bhutan at 2400-4200 m. alt.

MORINDA (*Rubiaceae*)

M. citrifolia Linn.

Special chemical components of the heartwood (*J. sci. industr. Res.*, 1961, **20B**, 331).

Root exts. hypotensive and anticongestive (*J. Amer. pharm. Ass., Sci. Ed.*, 1958, **47**, 162). The hypotensor activity resides in the water-sol. fraction of the root (*J. Amer. pharm. Ass., Sci. Ed.*, 1960, **49**, 271).

M. coreia Buch.-Ham.; see **M. tinctoria** Roxb.

M. tinctoria Roxb. syn. *M. coreia* Buch.-Ham.

Special chemical components of the heartwood (*J. sci. industr. Res.*, 1959, **18B**, 367).

MORINGA (*Moringaceae*)

M. oleifera Lam. syn. *M. pterygosperma* Gaertn.

Bark yields a base, moringine, identical with benzylamine (*Bull. Calcutta Sch. trop. Med. Hyg.*, 1955, **3**, 162).

Antibiotic principle, pterygospermin (*Curr. Sci.*, 1950, **19**, 554; *Indian J. Pharm.*, 1953, **15**, 315; *Indian J. med. Res.*, 1957, 191, 197).

Stem-bark contains β-sitosterol (*Arch. Pharm. Berl.*, 1957, **290**, 302; *Chem. Abstr.*, 1957, 17099 *d*).

Studies in free amino acids, organic acids and sugars (*J. Univ. Bombay*, 1959, 11).

MUCUNA (*Leguminosae*)

***M. nigricans** Steud. syn. *M. imbricata* DC.

B.–*Kasi*; Nepal–*Kaoso*; Lepcha–*Dangyimrik*; Mundari–*Marang-itika*; Assam–*Mekuri-ghila*.

The watery sap from the stems is used in Philippines for cough and fevers. The hairs on pods produce dermatitis (*Wlth India*, **VI**, 443).

Found in the sub-Himalayan tracts, Bihar, North Bengal, Assam, Madhya Pradesh and Andamans.

M. prurita Hook. syn. *M. pruriens* Baker non DC.

Four new alks.: mucuadine, mucuadinine, mucuadininine and prurienidine, and small amounts of nicotine (*Indian Pharm.*, 1954, **10**, 79; *Indian J. Pharm.*, 1956, **18**, 385). Pods most active anthelmintic against *Tenia cannina* and *paraphistonum* (*J. Indian med. Ass.*, 1963, **41**, 435).

MUNDULEA (*Leguminosae*)

M. sericea (Willd.) Greenway syn. *M. suberosa* Benth.

Root-bark, ether ext. (*J. sci. industr. Res.*, 1955, **14B**, 105, 124). Isolation of 'munetone', the active principle of the root-bark and its characterization (*J. Indian chem. Soc.*, 1956, 716; 1959, 165). Besides munetone, another isoflavone, mundulone, isolated from the African variety (*J. Indian chem. Soc.*, 1962, 475; *Indian J. Pharm.*, 1964, 171).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Variation in constituents of root-bark and locality factors (*J. sci. industr. Res.*, 1958, **17B**, 384).

Stem-bark, highly insecticidal; its active principle isolation (*Indian J. Ent.*, 1955, **17**, 165).

MURRAYA (*Rutaceae*)

M. koenigii (Linn.) Spreng.

English–*Indian curry-leaf tree.*

Chem. compn. (*Saugar Univ. J.*, 1958, **7**, pt. II, Sect. A, No. 7, 49; (*Indian Soap J.*, 1958, **23**, 201; *Perfum. essent. Oil Rec.*, 1961, **52**, 152, 643). Structure of girinimbin isolated from stem-bark (*Sci. & Cult.*, 1964, **30**, 445).

MUSA (*Musaceae*)

M. paradisiaca Linn. syn. *M. sapientum* Linn.

Unripe fruit astringent.

Bananas contain two physiologically important compds., serotonin and norepinephrine, in addition to dopamine and an unidentified catecholamine. The concentration of these compds. varies in the pulp and peal portions. The therapeutic uses of banana (in coeliac disease, constipation, peptic ulcer, etc.) is due to these active principles (*Science*, 1958, 648).

Banana fruit—mild laxative. It aids in combating diarrhoea and dysentery and promotes the healing of intestinal lesions in ulcerative colitis.

Banana powder—effective in the treatment of coeliac disease, sprue and other carbohydrate intolerance in children; it is used for intestinal disorders in adults.

Ripe fruit—useful in diabetes, uremia, nephritis, gout, hypertension and cardiac diseases.

Unripe fruit and cooked flowers—useful in diabetes.

The juice of flowers—used for dysentery and stems and root for disorders of the blood.

The stalk of fruited plant is given to pigs in China for kidney worms (*Stephanurus dentatus*). The ash of the root or of the whole plant is anthelmintic (*Wlth India*, VI, 467). Tryptophan and indole compds. in banana ovaries (*Nature, Lond.*, 1962, 775).

M. paradisiaca Linn. var. **sapientum** Kuntze syn. *M. sapientum* Linn.

Leaves give *n*-$C_{29}H_{60}$ of m.p. 63-65° (*Ann. chim. Roma*, 1955, **45**, 1126; *Chem. Abstr.*, 1957, 3925 *e*).

MUSSAENDA (*Rubiaceae*)

***M. glabra** Vahl

Assam–*Charai-atha, Chuba-atha, Sonarupa*; Mundari–*Kula marsal.*

Leaves chewed with betel and used as infusion to relieve cough; a decoction of the root also used for the same purpose.

Flowers possess diuretic properties and used in asthma, recurrent fevers and dropsy (BURKILL, 1519).

Found in tropical Himalayas from Nepal eastwards, Bihar, Bengal and Assam up to 1500 m. alt.

MYRICA (*Myricaceae*)

M. nagi Thunb. syn. *M. rubra* Sieb.

Contains taraxerol in 0·01% yield (*J. pharm. Soc. Japan*, 1954, **74**, 127; *Chem. Abstr.*, 1955, 4233 *d*).

M. rubra Sieb.; see **M. nagi** Thunb.

MYRISTICA (*Myristicaceae*)

***M. beddomei** King

Seed kernels contain light yellow fat in 24% yield. Components of acids and glycerides of the seed fat (*J. sci. industr. Res.*, 1958, **17B**, 283).

Throughout India.

M. fragrans Houtt.

Oil of nutmeg; varies from 6 to 16% according to the origin and quality of spice (*Proc. Indian Sci. Congr.*, 1949, 102).

Nutmeg butter—nutmeg contains 38-43% of ether extractable matter from which is obtained 24-30% of the butter by cooking or steaming (*J. Sci. Fd Agric.*, 1957, **8**, 537; *Wlth India*, VI, 477).

Mace—consists of flattened lobed pieces 2·5 cm. or more in length; it yields a fat similar to that from nutmeg (*Curr. Sci.*, 1953, 81). Both nutmeg and mace are used as a condiment and in medicine.

Nutmeg is considered stimulant, carminative, astringent and aphrodisiac; used in tonics, electuaries and for dysentery, stomachache, flatulence, nausea, vomiting, malaria, rheumatism, sciatica and early stage of leprosy. Excessive doses have narcotic effect with symptoms of delirium and epileptic convulsions (BURKILL, 1528; *J. Bombay nat. Hist. Soc.*, 1954-55, 515).

Leaves give essen. oil (0·41-0·62%); undiluted oil phytocidal to common weeds (*Sci. & Cult.*, 1953, **19**, 186).

MYRTUS (*Myrtaceae*)

M. communis Linn.

Essen. oil of leaves from Portugal; myrtinyl acetate, myrtenol and cineol, etc. (*Not. farm, Porto*, 1952, **18**, 194);

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

physical data (*Experienceas, Madrid*, 1952, **61**, 1); in fresh branches 0·34-0·45%, dry branches 0·49-0·59% and dry leaves 0·57-1·01% of oil of high ester value (*Acta pharm. jugosl.*, 1952 **2**, 75); physical data of Portuguese aromatic plants (*Congr. Luso-espan. farm.*, 1952, **3**, 163; *Chem. Abstr.*, 1954, 11732*f*); possesses antibacterial activity against Gram-positive microorganism, even in high dilution, not affecting most of the Gram-negative microorganisms (*Farm. Zh.*, 1960, **15**, No. 6, 47; *Chem. Abstr.*, 1961, 18012 *g*). Myrtle oil from leaves 0·293% (*Indian Perfumer*, 1961, **5**, 23).

NARDOSTACHYS (*Valerianaceae*)

N. jatamansi DC.

Essen. oil from the rhizome (*J. sci. industr. Res.*, 1958, **17B**, 473).

NELUMBO (*Nymphaeaceae*)

N. nucifera Gaertn. syn. *Nelumbium speciosum* Willd.; *N. nelumbo* Druce

English–*Sacred lotus*.

Rhizomes yield a kind of arrowroot which is administered for diarrhoea and dysentery in China. A tea is made for menorrhagia in Cambodia.

Embryo (called 'mekula') used to reduce high fever and in treatment of cholera, haemoptysis and spermatorrhoea in China and Malaya.

Petals pounded and administered for syphilis. They are given to remove 'kapha' and 'pitta'. Sedative in the uterus; good in thirst, piles, inflammation and poisoning.

Leaves yield alks. nuciferine, roemerine and nornuciferine (*Yakugakuzasshi*, 1961, **81**, 469; *Chem. Abstr.*, 1961, 18015 *d*); fresh leaves on extraction yield nelumboside 0·1% which is quercitin 3-glucoglucuronide (*Yakugakuzasshi*, 1961, **81**, 1158; *Chem. Abstr.*, 1962, 1527 *d*).

NEOLITSEA (*Lauraceae*)

***N. cassia** (Linn.) Kostermans syn. *N. zeylanica* (Nees) Merrill; *Litsea zeylanica*. Nees

Mar.–*Kanvel, Chirchira*; Tel.–*Akupatricum*; Tam.–*Molaga shembagapalei*; Kan.–*Bilinisangi, Massimara*; Mal.–*Vayana*.

Root used in Kelantan and Pahang for poulticing eruptions on fingers.

Found in Bhutan and the Khasia mountains; on the Western Ghats from the Konkan southwards and from Quilon, ascending to 2000 m. on the Nilgiris.

NEPETA (*Labiatae*)

N. cataria Linn.

Essen. oil useful as a drug; highest yield from partially dried material (*Planta med.*, 1957, **5**, 51; *Chem. Abstr.*, 1957, 12439 *f*).

Kashmir.

N. ciliaris Benth.

Essen. oil (0·54% yield) [*Parfum. Kosmetik*, 1964, **45**(5), 127].

N. hindostana (Roth) Haines syn. *N. ruderalis* Buch.-Ham.

Essen. oil from leaves, yield 0·5% (*Saugar Univ. J.*, 1958, **7**, No. 7, 49; *J. sci. industr. Res.*, 1962, **21B**, 404).

***N. laucophylla** Benth.

Essen. oil (0·7% yield) (*Soap Perfum. Cosmet.*, 1964, **37**, 45).

Simla to Kumaon, 2000-2500 m. alt.

NEPTUNIA (*Leguminosae*)

***N. prostrata** Baill. syn. *N. oleracea* Lour.

Root—in Malaya used in the late stages of syphilis; the body is moistened with an infusion in fever and juice of stem is squeezed into the ear for earache (Burkill, 1549).

NERIUM (*Apocynaceae*)

N. indicum Mill. syn. *N. odorum* Soland.

English–*Indian oleander*.

Leaves—isolation of oleandrin (*J. pharm. Soc. Japan*, 1950, **70**, 239; *Chem. Abstr.*, 1951, 822 *f*), yield neriodin, twice as active as digitoxin and ursolic acid; contain adynerin (*J. pharm. Soc. Japan*, 1954, **74**, 1263; *Chem. Abstr.*, 1955, 4233 *d*). Separation of cardiotonic principles (*Japan Patent* 1948, 54); dried leaf or its alcoholic ext., taken orally or by injection, is an effective cardiac stimulant; as compared with digitalis, it has broader action and is less toxic (*Yao Hsueh Tung Pao*, 1959, 390; *Chem. Abstr.*, 1962, 8840 *g*). Constituents (*Acta Primae Secundae Acad. med. Shanghai*, 1959, **2**, 131; *Biol. Abstr.*, 1961, 12037). Cardiotonic principle resembles digitalis [*Igaku Kenkyu*, 1958, **28**(11), 4139; *Biol. Absr.*, 1960, 19789].

N. oleander Linn.

English–*Oleander*.

Pharmaco-chemical investigation of leaves, stems and flowers (*Dokl. Akad. Nauk Azerb. SSR*, 1953, **9**, No. 6, 353; *Chem. Abstr.*, 1956, 5240 *b*); isolation of flavone glycosides, viz. quercetin-3-rhamnoglucoside and kaempferol-3-rhamnoglucoside (*Arch. Pharm. Berl.*, 1956, **289**, 613; *Chem. Abstr.*,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

1957, 8376 *f*). Leaves give cardenolide glycosides, oleandrin, deacetyloleandrin, adynerin and neriantin (*Naturwissenschaften*, 1964, **51**, 139; *Chem. Abstr.*, 1964, 534 *d*).

NICANDRA (*Solanaceae*)

N. physaloides (Linn.) Gaertn.

Kan.–*Neelipuddae gida*; Bo.–*Ranpopati*.

Plant does not contain a purgative, but an alk. with midriatic reaction is present (*Chem. Abstr.*, 1954, 4771 *f*).

NICOTIANA (*Solanaceae*)

N. rustica Linn.

Nicotine determination in tobacco by simple and rapid method (*An. Real Soc. Espan. Fis. Quim.*, 1954, **50B**, 413; *Chem. Abstr.*, 1955, 3479 *f*). Biosynthesis of the nicotiana alks. (*Amer. Scient.*, 1960, 321; *Biol. Abstr.*, 1961, 8697).

N. tabacum Linn.

Occurrence of *l*-quinic acid in leaves of the shade grown plants (*Science*, 1957, **126**, 504); chlorogenic and caffeic acids determination (*Chem. Abstr.*, 1958, 20909 *c*).

Terpenic constituents of tobacco—review of search for carcinogenic substances (*Perfum. essent. Oil Rec.*, 1964, 124).

NIGELLA (*Ranunculaceae*)

***N. damascena** Linn.

Seeds used medicinally in Europe. Contain an alk. 'damascenine' and a volatile oil of agreeable odour.

Seeds yield 43·5% fatty oil consisting of 97·08% total fatty acids, out of which 30·03% was free fatty acid. Presence of lipase in the seeds is suggested on account of the high acid value (*Curr. Sci.*, 1961, **30**, 55).

Cultivated in north-west of India.

N. sativa Linn.

Essen. oil separated from the crude oil of *N. sativa* found active in protecting guinea-pigs against histamine induced bronchospasm. Nigellone, the crystalline active principle, is the single constituent of the carbonyl fraction of the oil (*J. pharm. Sci. U.A.R.*, 1960, **1**, 9; *Chem. Abstr.*, 1962, 6091 *g*). Constitution of the essen. oil from Egyptian seeds [*Planta Med.*, 1963, **11**(4), 465].

NYCTANTHES (*Oleaceae*)

N. arbor-tristis Linn.

Essen. oil (*Perfum. essent. Oil Rec.*, 1954, **45**, 80). Leaves give mannitol, β-amyrin, β-sitosterol, hentriacontane, benzoic acid, besides glycosides, free glucose and fructose (*J. Indian chem. Soc.*, 1964, **41**, 192).

OCIMUM (*Labiatae*)

O. americanum Linn. syn. *O. canum* Sims.

Essen. oil (*Indian J. agric. Sci.*, 1955, **25**, 73).

O. basilicum Linn.

Essen. oil, yield 0·16-0·60%; composition: methyl cinnamate 43·6-74·3%, methyl chavicol 6·5-24·3%, linalool 8·6-33·6% and ocimene 0·8-5·6% (*Indian Soap J.*, 1953-54, **19**, 251). Essen. oil bearing plant of Kashmir (*Indian J. agric. Sci.*, 1955, **25**, 73). Investigation of Basil oil [*J. pharm. Sci.*, 1964, **53**(9), 1033; *Chem. Abstr.*, 1964, **61**, 14462 *e*).

O. canum Sims.; see **O. americanum** Linn.

O. gratissimum Linn.

Essen. oil, composition: eugenol (60·5%); ocimene (19·4%) and cadinene (10%) (*Formosan Sci.*, 1948, **2**,62); from Russian variety grown in India, yield 0·27% (*J. Indian chem. Soc.*, 1952, **29**, 203); chem. compn.: eugenol (62%), ocimene (18%), *l*-cadinene 3% and 1-perillyl alcohol 4% (*Perfum. essent. Oil Rec.*, 1960, **51**, 611).

***O. kilimandscharicum** Guerke

English–*Camphor Basil*.

H.–*Kapur tulsi*; B.–*Karpur tulsi*.

Total distillate—camphor oil and camphor; yield in withered and shade-dried leaves (*J. sci. industr. Res.*, 1950, **9B**, 281); yield 6·13%, of which two-thirds or more is camphor (*Anais Fac. Farm Odontol. Univ. Sao Paulo*, 1950, **8**, 127; *Chem. Abstr.*, 1952, 9263); yield of oil and camphor (*Indian Soap J.*, 1951, **17**, 85; *J. Indian chem. Soc.*, 1952, **29**, 112; *Sci. & Cult.*, 1954, **19**, 254; *An. Dir. nac. Quim. B. Aires*, 1955, **8**, No. 16, 53). Plants, grown in Darjeeling, yield essen. oil 2·5-7·6%, of which 50-70% is camphor (*J. Instn Chem. India*, 1961, **33**, 214); yield 2500 lb. of camphor per acre at 3000 ft elevation (*Soap Perfum. Cosmet.*, 1962, **35**, 896). Separation of camphor, from essen. oil (*Perfum. essent. Oil Rec.* 1964, 121).

Native of Kenya; introduced and cultivated in India.

O. sanctum Linn.

Essen. oil bearing plant of Kashmir (*Indian J. agric. Sci.*, 1955, **25**, 73). Therapeutic value of the essen. oil and its chem. compn. (*Congr. Luso-espan farm.*, 1952, **3**, 187; *Chem. Abstr.*, 1954, 11728 *a*).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The plant is used medicinally in villages; it contains citric, tartaric and malic acids (*Agra Univ. J. Res.*, 1960, 175).

OENANTHE (*Umbelliferae*)

***O. javanica** (Blume) DC. syn. *O. stolonifera* Wall. ex DC.

B.–*Pan-turasi*; Mundari–*Ependung*.

Fruits—essen. oil containing phellandrene (*Ann Rept. Fac. Pharm. Kanazawa Univ.*, 1952, **2**, 1; *Chem. Abstr.*, 1954, 4777). Oil and its fatty acids (*J. pharm. Soc. Japan.*, 1952, **72**, 47; *Chem. Abstr.*, 1952, 8812 *e*).

Sub-Himalayan tract in marshy localities; Java and China.

***O. stolonifera** Wall. ex DC.; see **O. javanica** (Blume) DC.

OLDENLANDIA (*Rubiaceae*)

O. biflora Linn. syn. *Hedyotis biflora* (Linn.) Wight. & Arn.

Chemical examination reveals only ursolic acid, no alk. (*J. sci. industr. Res.*, 1958, **17B**, 73). Constituents, isolation and characterization (*Res. J. Hindi Sci. Acad.*, 1958, 169).

O. corymbosa Linn. syn. *Hedyotis corymbosa* (Linn.) Lam.

The plant contains 0·12% alks., biflorine and biflorone, which are interconvertible. The concentration of biflorone increases at the cost of biflorine in stored plants. Those stored for 3-4 years contain no alk. (*J. Indian chem. Soc.*, 1952, 286; 1954, 741). The other constituents are β-sitosterol and eleanolic and ursolic acids but no alks. (*J. Amer. pharm. Ass., Sci. Ed.*, 1960, **49**, 562).

***O. fruticosa** K. Schum. syn. *Hedyotis fruticosa* Linn.

A decoction of the leaves used for inflamed eyes in Ceylon (Lewis, 227).

Occurs in the hills of Travancore.

O. herbacea Roxb. syn. *Hedyotis herbacea* Linn.

The plant is bitter, tonic and febrifuge. Its decoction is used in the treatment of malaria and for bathing rheumatic patients. Its powder with honey is given for rheumatic fevers and swellings. The herb is boiled in oil and this oil is used in elephantiasis and pains in the body. Leaves used as expectorant in asthma and consumption (*Wlth India*, **V**, 15).

Chemical examination reveals only ursolic acid; no alk. (*J. sci. industr. Res.*, 1958, **17B**, 73).

***O. hispida** Benth. syn. *Hedyotis hispida* Retz.

Decoction of the herb is given in dysentery. The plant is employed in the preparation of poultices for headaches and stomachaches (*With India*, **V**, 127).

Occurs in the outer Himalayas and north-eastern parts of India.

***O. scandens** K. Schum. syn. *Hedyotis scandens* Roxb.

Nepal–*Bohril lahara*; Assam–*Bhedeli lot*.

The plant is used in eye diseases and troubles following childbirth and the root used for sprains.

The plant contains a glucoside and two crystalline compds., all related to rotenone and most of them active as fish poisons (*Proc. Pakist. Sci. Conf.*, 1953, 119).

Found from Nepal to Assam, up to about 2000 m.

O. umbellata Linn. syn. *Hedyotis umbellata* (Linn.) Lam.

English–*Chay-root, Indian madder*.

Chay-roots contain alizarin, rubichloric acid, and ruberythric acid, alizarin α-methylether, acetylalizarin, etc. (Perkin & Everest, 36).

OLEA (*Oleaceae*)

O. europaea Linn.

Blood pressure lowering principle of aq. exts. of leaves, a kind of choline compd. [*Arch. int. Pharmacodyn.*, 1957, **112**(3/4), 342; *Biol. Abstr.*, 1958, 41939].

Unsaturated lactone, elenolide (*Rec. trav. chim.*, 1957, **76**, 839; *Chem. Abstr.*, 1958, 3258 *i*). Oleuropeic acid (*Nature, Lond.*, 1959, **184**, Suppl. 26, 2019).

Cultivated in Coonoor.

OPHIORRHIZA (*Rubiaceae*)

O. mungos Linn.

Reported to be useful in the treatment of cancer.

Root exts. give β-sitosterol, 5α-ergost-7-en-3β-ol and 5α-ergost-8-(14)-en-3β-ol (*J. sci. industr. Res.*, 1959, **18B**, 114).

OPUNTIA (*Cactaceae*)

O. dillenii Haw.

Flowers contain glycosides of isorhamnetin and quercetin (*J. sci. industr. Res.*, 1961, **20B**, 507). Iso-quercitrin sepn. (*Curr. Sci.*, 1964, 211).

O. vulgaris Mill.

Flowers yield 2% flavonoside which causes slight hypotension in dogs and inhibits peristalsis in rabbit intestines (*C.R. Acad. Sci., Paris*, 1951, **233**, 90; *Chem. Abstr.*, 1951, 9807 *f*).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

OREOCNIDE (*Urticaceae*)

***O. integrifolia** Miq. syn. *Villebrunea integrifolia* Gaudich

Ass.–*Banrhea, Risa, Lukoi*; Lepcha–*Kuffyet-kee*.

The juice of the plant is taken in Java for retention of urine, also used as an eyewash and for pimples. In Sumatra, a poultice of the leaves is applied to the head for headache.

Sikkim, Assam, Burma, the Andaman and Nicobar Islands; the Western Ghats and Ceylon.

ORIGANUM (*Labiatae*)

O. vulgare Linn.

Essen. oil composition: *dl*-pinene, dipentene, linalool and some bi- and tricyclic sesquiterpenes (*J. sci. industr. Res.*, 1959, **18B**, 128).

ORTHOSIPHON (*Labiatae*)

***O. pallidus** Royle ex Benth.

'Orthosiphonol', its isolation and chemical study. Isolation of choline and betaine [*J. Amer. pharm. Ass., Sci. Ed.*, 1956, **45**(9), 595].

Found from Kashmir and the Punjab to Bihar and southwards to Travancore.

OSMANTHUS (*Oleaceae*)

***O. fragrans** Lour.

U.P. Hills–*Silang*; N. Bengal & Lepcha–*Tungrung*.

Flowers yield asmane as also triterpenoids and steroids (*Yakugakuzasshi.*, 1957, **77**, 566; 1958, **78**, 287; *Chem. Abstr.*, 1957, 15069 *d*).

Found in temperate Himalayas, alt. 1-2000 m., from Garhwal to Sikkim and Khasia Mts., China and Japan.

OUGEINIA (*Leguminosae*)

O. dalbergioides Benth.

The heartwood contains homoferreirin (0·4%) and a new isoflavanone, ougenin [*J. sci. industr. Res.*, 1961, **20**(B), 134].

OXALIS (*Oxalidaceae*)

O. acetosella Linn.

Kumaon–*Amrul, Chalmori*.

Plant—diuretic.

PACHYRRHIZUS (*Leguminosae*)

***P. erosus** (Linn.) Urban syn. *P. angulatus* Rich. ex DC.

H. & B.–*Sankalu*.

Young pods eaten as substitute for French beans.

Leaves poisonous to cattle other than horses; they contain pachyrrhizid.

Seeds poisonous; pounded and dropped in water to stupefy fish. Powdered seeds are applied for skin affections like prickly heat. They are used as laxative and vermifuge (BURKILL, 1620).

Rotenone and pachyrrhizid, pachyrrhizone, erosone and two saponins in seeds are toxic substances (*J. Amer. pharm. Ass.*, 1953, 117).

Native of tropical America; widely cultivated in India.

PAEDERIA (*Rubiaceae*)

P. foetida Linn.

Foetid smell due to methyl mercaptan (*Trans. Bose Res. Inst.*, 1953-55, **19**, 77).

PAJANELIA (*Bignoniaceae*)

***P. longifolia** K. Schum. syn. *P. rheedii* Wight.

Mar.–*Doundi*; Tam.–*Aranthal*; Kan.–*Alangi*; Mal.–*Arlantha, Paiyani, Pajaneli*; Khasi–*Dieng-lang-leng*; Andamans–*Jhingan*.

It is used in Malaya medicinally like *Oroxylum indicum* Vent.

Leaves decoction as hot fomentation is used for stomach disorders.

Found in the hills of Assam, in Western Ghats from N. Kanara to Travancore and in the Andaman Islands.

PANAX (*Araliaceae*)

***P. ginseng** C. A. Mey; see **Aralia quinquefolia** Decne. & Planch.

PANCRATIUM (*Amaryllidaceae*)

***P. zeylanicum** Linn.

Malay–*Berambang butan*.

Roots—irritant, employed externally for fever.

Bulbs—said to be medicinal in Java; contain a poison, possibly lycorine, an alk. which acts as an emetic and causes death by paralysis of the central nervous system.

Found throughout India.

PANDANUS (*Pandanaceae*)

P. tectorius Soland. ex Parkinson

Essen. oil yield 0·28-0·31% (*Perfum. essent. Oil Rec.*, 1951, **42**, 114; 1954, **45**, 219).

PAPAVER (*Papaveraceae*)

P. orientale Linn.

Alks.; seasonal variation of thebaine and isothebaine [*Lloydia Cincinnati*, 1956, **19**(1), 59; *Biol. Abstr.*, 1957, 15173].

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

P. rhoeas Linn.

Petals and pericarps contain 0·06% of rhoeadine and another base identical with porphyroxine meconidine from opium [*Arch. Pharm. Berl.*, 1957, **290**(62), 367].

Structure of the main alk., rhoeadine, and its oxidation product, rhoeagenine [*Arch. Pharm. Berl.*, 1959, **291**(1/6), 293]. Papaver rhoeas 'alkaloid A', previously called rhoerubine, may be a stereoisomer of rhoeadine and is renamed isorhoeadine (*Arch. Pharm. Berl.*, 1961, **291**, 301; *Chem. Abstr.*, 1961, 20330 *c*).

P. setigerum DC.; see **P. somniferum** Linn.

P. somniferum Linn. syn. *P. setigerum* DC.

Morphine colorimetric determination (*Acta pharm. int.*, 1960, **1**, 219); gravimetric (*Dtsch. Apoth-Ztg.*, 1951, **91**, 419); photometric in poppy seeds (*Pharmazie*, 1951, **6**, 55; *Chem. Abstr.*, 1951, 10494 *h*, *i*); chromatographic (*Arzneimittel-Forsch.*, 1953, **3**, 468; *Chem. Abstr.*, 1954, 1634 *a*); polarographic estimation in capsules (*Pharm. Zentralh.*, 1955, **94**, 347; 1956, **95**, 189; *Chem. Abstr.*, 1958, 11354 *e*, 12317 *f*; *Bull. Narcot.*, 1958, **10**, 3). Morphine detection, improvement in Decker's test (*Dtsch. Z. ges. gerichtl. Med.*, 1954, **43**, 259; *Chem. Abstr.*, 1955, 565 *h*). Alks. determination in poppies by steeping of poppies in alkaline water and extracting (*Chem. Zvesti.*, 1954, **8**, 596; *Chem. Abstr.*, 1955, 7870); spectrophotometric determination in opium (*J. Amer. pharm. Ass.*, 1955, **44**, 156). Morphine determination in poppy capsules (*Medd. Norsk Farm. Selskap.*, 1963, **25**, 117; *Chem. Abstr.*, 1964, **60**, 3949 *h*).

Morphine yield in roots 0·03%, in stems 0·05%, in leaf 0·045% and in capsules 0·11% (*Arch. Pharm. Berl.*, 1958, **281**, 109; *Chem. Abstr.*, 1958, 14081 *i*).

Indian opium consists of 10% morphine, narcotine and meconic acid potential value 0·6% and papaverine 0·1% (*J. sci. industr. Res.*, 1949, **8A**, 118). Preparation and interconversion of poppy alks., Kabay's method supplemented to separate codeine, narcotine, etc. (*Bull. Inst. Chim. Acad. Bulgare Sci.*, 1953, **2**, 153; *Chem. Abstr.*, 1954, 10998 *h*). Presence of narcotine in opium (*Arch. Pharm. Berl.*, 1957, **290**, 269; *Biol. Abstr.*, 1958, 24713). Separation of opium alks. by alumina plate chromatography, spot differences between Indian and Turkish opium (*R.C. Ist. sup. sanit.*, 1959, **22**, 759; *Chem. Abstr.*, 1960, 11374 *g*). Colour reaction and estimation of morphine (*J. sci. industr. Res.*, 1962, **21D**, 449). Narcotoline in opium (*Zh. prikl. Khim., Mosk.*, 1958, **31**, 323; *Chem. Abstr.*, 1957, 11350 *i*). Narcotine isolation from poppy straw (*Acta polon. pharm.*, 1956, **13**, 447; *Chem. Abstr.*, 1957, 9090 *e*). Trace elements for determining opium origin (*Radio-chim. Acta*, 1963, **1**, 109; *Analyt. Abstr.*, 1964, **11**, 1455). Important secondary alks. of opium—codeine, thebaine, papaverine and narcotine (*Pharm. Acta Helvet.*, 1961, **36**, 57; *Chem. Abstr.*, 1964, **61**, 2907 *a*).

Opium capsules—determination of codeine, narcotine and thebaine chromatographically [*Pharmazie*, 1958, **13**(2), 95; *Biol. Abstr.*, 1959, 11421].

Proteins in seeds of varieties of poppy, their nature and quality (*J. sci. industr. Res.*, 1956, **15B**, 211).

PARAMERIA (*Apocynaceae*)

***P. barbata** K. Schum.

Bark—highly valued medicinally in Malaya and Java; is given after childbirth to make the uterus shrink.

In Bali a decoction is given for dysentery and is also used for wounds. In Philippines, the bark macerated in oil is a vulnerary and used internally for tuberculosis.

A large climber found from north-eastern India to Andaman Islands.

***P. polyneura** Hook. f.

The Malayans use it medicinally just as they use *P. barbata*.

Its bark used as the source of a wash after childbirth; it enters into tonics given internally.

Found in Assam.

PARMELIA (*Parmeliaceae*)

***P. cirrhata** Fr.

Three crystalline components—atranorin, α-protolichesterinic acid and salazinic acid isolated (*Indian J. Pharm.*, 1955, 50).

Sub-Himalayan tract of India.

***P. nilgherrensis** Nyl.

Two crystalline components—atranorin and collatolic acid isolated (*Indian J. Pharm.*, 1955, 50).

Sub-Himalayan tract of India.

P. perlata (Huds.) Ach.

Two crystalline components—lecanoric acid and atranorin isolated (*Indian J. Pharm.*, 1955, 50).

Kashmir hills.

***P. tinctorum** Despr.

H.–*Awasthi*.

Lecanoric acid, a crystalline component, is recoverable in 10% yield

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(*Indian J. Pharm.*, 1955, 49). Isolation of methyl β-orcinol carboxylate (*J. sci. industr. Res.*, 1960, **19B**, 508). Food preparation components: amino acids—leucine, valine, tyrosine, alanine, glycine and threonine besides others (*Indian J. Chem.*, 1964, **2**, 467).

PASSIFLORA (*Passifloraceae*)

P. edulis Sims.

English–*Passion fruit.*

Juice contains free organic acids, citric acid alone contributing about 95% of the total acids (*J. sci. industr. Res.*, 1958, **17B**, 238). Free amino acids of the passion fruit juice contain proline (*Sci. & Cult.*, 1964, **30**, 48).

PAVONIA (*Malvaceae*)

P. odorata Willd.

Essen. oil from roots, unpleasant smell, a yield of 0·5% (*Perfum. essent. Oil Rec.*, 1959, **50**, 896); preparation of resinoids and essen. oil and oil-free distilled water (*J. Instn Chem. India*, 1961, **33**, 229).

PAYENA (*Sapotaceae*)

***P. lucida** A. DC. syn. *P. costata* King.

Root decoction is given after childbirth.

Found in Andaman and Nicobar Islands.

PEDILANTHUS (*Euphorbiaceae*)

***P. tithymaloides** Poit.

B.–*Bilati-sij*; Bo.–*Vilayti-sher*; M.P.–*Nag-phani.*

Roots powerful emetic; known as 'ipecacuanha' in the West Indies. Milk from the green parts applied to warts. In Malaya, it is applied to the skin for leucoderma and for scorpion and centipede bites.

Native of the West Indies, now much cultivated in India and planted in hedges and as a pot-plant.

PEGANUM (*Rutaceae*)

P. harmala Linn.

Contains quinazoline besides harmine, harmaline, harmalol and peganine. Harmine is the most important, being present in all parts of the plant. Ripe seeds contain 3·8-5·8% of the last four alks. These are ineffective as contact poison but active in vapour form; effective against algae, in higher concentrations, to water animals and lethal to moulds, bacteria and intestinal parasites (*Dtsch. Apoth-Ztg.*, 1960, **100**, 255; *Chem. Abstr.*, 1961, 16913 *c*). Paper chromatography of the alks. (*Indian J. Pharm.*, 1960, 233). Alk. constituents of the seeds: harmaline and harmine, an eutectic mixture; the mother liquor gives vasicine [*Pakist J. sci. industr. Res.*, 1962, 5(4), 207].

PELARGONIUM (*Geraniaceae*)

***P. graveolens** L'Herit.

Essen. oil from plants raised in Jammu; yield 0·08% (*Indian Oil Soap J.*, 1963, **29**, 134).

Native of South Africa, cultivated in India.

***P. roseum** (R. Br. in) Ait.

Essen. oil (*Compt. rend.*, 1959, **249**, 2079; *Chem. Abstr.*, 1960, 17804 *g*); composition: geranyl tiglinate 19·0, total alcohol in original oil 64·0% (*Orv. Szle*, 1960, **6**, 224; *Chem. Abstr.*, 1960, 23202 *b*). Monoterpene fraction in oil [*Agric. biol. Chem. Tokyo*, 1964, **28**(1), 5; *Chem. Abstr.*, 1964, **60**, 11841 *g*].

South Africa; cultivated in India for its showy flowers.

PELTOPHORUM (*Leguminosae*)

***P. dasyrachis** Kurz ex Baker

Bark used as a substitute for Parkia bark in infusion for coughs.

Andaman Islands.

PENNISETUM (*Gramineae*)

P. glaucum R. Br. syn. *P. typhoideum* Rich.

Thiamine contents of *bajri* grown under different treatments (*J. Maharaja Sayajirao Univ. Baroda*, 1958, **7**, 41). Course of alks. formation by claviceps strain in saprophytic cultures (*Arch. Pharm. Berl.*, 1962, **205**, 510; *Chem. Abstr.*, 1963, 1306 *d*).

PERGULARIA (*Asclepiadaceae*)

P. daemia (Forsk.) Chiov; see **P. extensa** N. E. Br.

P. extensa N. E. Br. syn. *P. daemia* (Forsk.) Chiov *Damaia extensa* R. Br.

Chemical investigation—presence of α-amyrin acetate, lupeol acetate, lupeol and β-sitosterol (*J. Amer. pharm. Ass.*, 1958, **47**, 559). From the plant ext. were recovered two new sterols, hentriacontane, lupeol, α-amyrin, β-amyrin, β-sitosterol and betaine. The musculotropic factor comparable to pituitrin activity shown to be polypeptide (*J. sci. industr. Res.*, 1959, **18B**, 422).

PERILLA (*Labiatae*)

P. ocimoides Linn.

Essen. oil, yield 0·3-1·3% containing 20% citral (*Przem. spozyw.*, 1953, **7**, 56; *Chem. Abstr.*, 1957, 8380 *f*).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PERISTROPHE (*Acanthaceae*)

P. bicalyculata Nees.
Antibacterial properties (*Indian J. med. Res.*, 1953, 161).

***P. bivalvis** Merr. syn. *P. tinctoria* Nees.
B.–*Bet-rang, Bhatia-rang.*
It gives a purplish dye. The leaves are used for poulticing for skin complaints.
Found from India to the Philippine Islands; cultivated frequently from Assam to Ceylon.

PEROVSKIA (*Labiatae*)

P. abrotanoides Karel.
Essen. oil, yield 0·29% containing camphor, *d*-α-pinene, β-pinene, cineol, etc. (*Izv. Acad. Nauk Kazakh. SSR*, 1961, No. 1, 107; *Chem. Abstr.*, 1961, 22718 *g*).

PETROSELINUM (*Umbelliferae*)

P. crispum (Mill.) Airy-Shaw.
Kan.–*Achumooda.*
Pure bergapten is obtained from alcoholic ext., responsible for photodynamic activity in skin disorders (*Gazz. chim. ital.*, 1954, **84**, 870; *Chem. Abstr.*, 1955, 7188 *a*).

PHAEANTHUS (*Annonaceae*)

***P. ebracteolatus** Merrill; see **Uvaria ebracteolata** Presl.

PHALARIS (*Gramineae*)

P. arundinacea Linn. syn. *Baldingera arundinacea* Dum.
The alks. of ergot occurring on this plant (0·32%) belong to ergotoxin group [*Pharmazie*, 1953, **8**(12), 1051; *Biol. Abstr.*, 1957, 15169].

PHASEOLUS (*Leguminosae*)

***P. calcaratus** Roxb.
English–*Rice bean.*
The leaves are used with rice-flour in a poultice applied to the abdomen for stomachache.
Native of south-eastern Asia; found from the Himalayas to Ceylon in the tropical zone, wild and cultivated; ascending to 1500 m. in Khasia.

P. mungo Linn.
Flours have strepogenin levels several times higher than in casein (*Indian J. Physiol. all. Sci.*, 1951, **5**, 83). Uridine diphosphate-galacturonic acid from seedlings (*Biochim. biophys. Acta*, 1961, 589, 590; *Biol. Abstr.*, 1962, **39**, 16172).

P. radiatus Linn.
Flours have strepogenin levels several times higher than in casein (*Indian J. Physiol. Pharmac.*, 1951, **5**, 83).

PHOENIX (*Palmae*)

P. dactylifera Linn.
Date palm pollen grains have gonadotrophic activity. Ext. of 10 g. of pollen increases the weight of ovaries, uteri, testes and seminal vesicles [*Experientia*, 1957, **13**(10), 411; *Biol. Abstr.*, 1958, 24719].

PHRAGMITES (*Gramineae*)

***P. communis** Trin.
Java–*Glagah asu, Plumpung*; H.–*Era*; Kashmiri–*Pitus.*
The tender sprouts are medicinal among the Chinese. The rhizome also used for medicinal purpose; it contains sugar 5%. Active medicinal compd. not yet certain.
The alks. of ergot occurring on *P. communis* (av. 0·27%) belong to ergotoxin group [*Pharmazie*, 1953, **8**(12), 1051; *Biol. Abstr.*, 1957, 15169].
Found in Kashmir lakes 16-1800 m., and Garhwal 12-1600 m.

PHYLA (*Verbenaceae*)

***P. nodiflora** (Linn.) Greene; see **Lippia nodiflora** Rich.

PHYLLANTHUS (*Euphorbiaceae*)

P. maderaspatensis Linn.
Seeds yield a fatty oil containing liquid acids, solid acids, unsaponifiable matter, colouring matter, diacetylmaderin and phenylhydrazone; but no alks., glucosides, saponins or free acids (*J. sci. industr. Res.*, 1959, **18B**, 446).

PHYLLOCHLAMYS (*Urticaceae*)

***P. taxoides** Koorders
A poultice of boiled bark is applied to ulcers. The smoke of burning bark is inhaled to cure a cold in the head.
Found widely from the Circars in the Deccan to Burma and Ceylon.

PHYSALIS (*Solanaceae*)

P. alkekengi Linn.
Review concerning pharmacology, chemical constitution and use in modern pharmaceutical industry (*Farm. Glasn.*, 1960, **16**, 20; *Biol. Abstr.*, 1961, 77987).

PHYTOLACCA (*Phytolaccaceae*)

P. acinosa Roxb.
Roots—physiologically active due to a steroid saponin. Their spermicidal

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

properties, 1:500 dilution of saponin in normal saline (*J. Egypt. med. Ass.*, 1963, 145; *Indian J. Pharm.*, 1964, **26**, 250).

PICRORHIZA (*Scrophulariaceae*)

P. kurroa Royle ex Benth.

Picrorhizin, its bitter principle as glucosidovanilloyl glucose (*J. Taiwan pharm. Ass.*, 1952, **4**, No. 1, 25).

Extraction of kurrim, a water-soluble crystalline compd. and its identn. as D-mannitol (*J. sci. industr. Res.*, 1949, **8B**, 173; 1959, **18B**, 219).

PILEA (*Urticaceae*)

***P. microphylla** Liebm. syn. *P. muscosa* Lindl., *Urtica microphylla* Linn.

English–*The Artillery plant, the Gunpowder plant.*

The plant pounded with a bitter garlic and salt put on the abdomens of small babies to expel worms in Malacca.

Native of South America; found as weed in India.

PIMENTA (*Myrtaceae*)

P. racemosa J. W. Moore

English–*Rum tree.*

Ext. distillation yields eugenols, chavicol, citrai, cineol, etc. (*Bull. Soc. chim. Fr.*, 1954, 1082).

PIMPINELLA (*Umbelliferae*)

P. anisum Linn.

English–*Spanish aniseed oil.*

Essen. oil (saunf oil) composed of 54% of anethol (*Indian Perfumer*, 1950, **5**, 401; *Chem. Abstr.*, 1951, 3124*f*).

Fatty oil from the fruits, green pigment [*C.R. Acad. bulg. Sci.*, 1958, **2**(1), 33; *Biol. Abstr.*, 1961, 82089].

PINUS (*Pinaceae*)

P. roxburghii Sarg. syn. *P. longifolia* Roxb.

Pine needle concentrates are sources of vitamins C and E and carotene. Hydrolysis of the needles with water containing 1% HCl or 3% H_2SO_4 yields exts. containing two-thirds of all vitamin C (*Chem. Abstr.*, 1955, 8559; *Indian J. agric. Sci.*, 1955, **25**, 73).

PIPER (*Piperaceae*)

P. aurantiacum Wall.

Dried fruit alcoholic ext. contains sugar but no alk. On injecting, dogs show hypertensive activity and strong stimulation of the uterus (*Univ. Rajputana Stud. med. Sect.*, 1953-54, 30).

P. betle Linn.

Essen. oil from the leaves, 0·7% yield (*Indian Soap J.*, 1956, **21**, 275; *Saugar Univ. J.*, 1958, **7**, pt. II, Sect. A, No. 7, 49).

***P. caninum** Blume.

The leaves are used by Jakuns in lieu of betel leaves for chewing. They are added to the betel-quid for treating hoarseness. A wash is made from the leaves for use after childbirth.

Found in Andaman Islands, the Malay Peninsula and Java.

P. cubeba Linn. f.

Essen. oil, sesquiterpene structure (*Perfum. essent. Oil Rec.*, 1955, **46**, 8).

***P. longum** Linn,

Two alks., piperine and piplartine, triacontane, dihydrostigmasterol and a steroid have been isolated from the stems (*Indian J. Pharm.*, 1952, 105). Piplartine, a new alk. (*Curr. Sci.*, 1963, **32**, 354). Essen. oil (*Parfum. Kosmetik*, 1963, **44**, 233); sesquiterpene (*Parfum. Kosmetik*, 1963, **44**, 261; *Chem. Abstr.*, 1964, **60**, 9095*f*). Crude exts. and alks. effect ciliary movements, suppress cough reflex (*Indian J. Pharm.*, 1964, **26**, 139).

P. nigrum Linn.

Piperine analysis in Indian varieties (*ISI Bull.*, 1960, 76).

***P. ribesioides** Wall.

Crushed leaves are used for poulticing in cases of swelling including dropsy in Pahang.

Found from Tenasserim and the Andaman Islands to Sumatra and the Malay Peninsula.

PIPTURUS (*Urticaceae*)

P. incanus Wedd.; see **P. velutinus** Wedd.

***P. velutinus** Wedd. syn. *P. incanus* Wedd.

The leaves used for poulticing boils, burns and herpes; also for removal of lice in the hair.

Found widely in Malaysia and the Pacific; Nicobar Islands.

PIRUS (*Rosaceae*)

***P. communis** Linn.; see **Pirus communis** Linn.

PISTACIA (*Anacardiaceae*)

P. integerrima Stew. ex Brandis

Essen. oil-from galls contains 94% of α-*d*-pinene (*J. Indian chem. Soc.*, 1950, **27**, 441).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Constituents of the gall: two triterpene acids, pistacienonic acids A and B (*Trans. Bose Res. Inst.*, 1956 (1958), **21**, 23).

PISUM (*Leguminosae*)

P. sativum Linn.

English–*Common pea.*

Occurrence of galactolipids (*Nature, Lond.*, 1961, 1301). Essen. oil (*Parfum. Kosmetik*, 1963, **44**, 233; *Chem. Abstr.*, 1964, **60**, 9095 *f*).

Sterility effect of the oil (*J. Indian chem. Soc.*, 1957, 247). Oral contraceptive (*Sci. & Cult.*, 1960, 661). Seed oil inhibits endometrial development; in human trials, oral capsules given to 727 women for 2 years reduced pregnancy rate by 60% and in male volunteers, 50% reduction in sperm count achieved (*Med. Dig. Bombay*, 1963, **31**, 486).

Crude exts. and alk., piplartine, affect the ciliary movements and suppress the cough reflex (*Indian J. Pharm.*, 1964, **26**, 139).

PITHECELLOBIUM (*Leguminosae*)

***P. angulatum** Benth.

Ashes of the leaves, mixed with coconut oil, applied for 'kudis chengkereng', a form of itch tending towards an abscess.

Found in east Himalayas and down the gulf of Malacca.

***P. clypearia** Benth.

Leaves used in poultices for ailments like coughs, sore legs, swellings, chickenpox and smallpox. The leaves said to be poisonous to cattle.

Found from the eastern Himalayas to the Philippine Islands.

PLANTAGO (*Plantaginaceae*)

P. lanceolata Linn.

Fresh leaves ext. has antibacterial properties (*Pharm. Zentralh.*, 1958, **97**, 66; *Chem. Abstr.*, 1958, 9513 *g*).

P. major Linn.

Seeds of Plantago species—investigations as laxatives. Seeds, gel in presence of water, increase in volume but do not interfere with the digestive process (*Planta Med.*, 1961, **9**, 232; *Chem. Abstr.*, 1962, 1526 *a*).

P. ovata Forsk.

Viscosity of acid polysaccharides from [*J. sci. industr. Res.*, 1961, **20B**(3), 101]. Seeds of Plantago species—investigations as laxatives (*Planta Med.*, 1961, **9**, 232; *Chem. Abstr.*, 1962, 1526 *a*). Evaluation of ispaghula (*Indian J. Pharm.*, 1963, **25**, 376). The embryo oil of seeds having 50% linoleic acid prevents atherosclerosis (*Indian J. Pharm.*, 1964, **26**, 80). Oil more active than safflower oil, reduces the serum cholesterol level in rabbits (*Indian J. Pharm.*, 1964, **26**, 268).

P. psyllium Linn.

Seeds of Plantago species—investigations as laxatives (*Planta Med.*, 1961, **9**, 232; *Chem. Abstr.*, 1962, 1526 *a*).

PLECTRANTHUS (*Labiatae*)

***P. incanus** Link.

Ten mg. of its essen. oil have the activity of 10 units of penicillin against *Staph. aureus* (*Indian J. Pharm.*, 1963, **25**, 189).

Found in the hills of India, Himalayas (Simla to Sikkim), up to an alt. of 1700 m. Khasia Mts. and Central India to the Anamalai Hills.

PLEOPELTIS (*Polypodiaceae*)

***P. phymatodes** Moore

Rhizomes are chewed by the people of Celebes and Bali and applied to the bites of lizards. The Javanese compound it in medicine for applying to the abdomen in confinement during difficult labour.

Found in the Old World Tropics.

PLEUROSTYLIA (*Celastraceae*)

***P. wightii** Wight & Arn.

Contains an alk., which is moderately poisonous (*Bull. Dep. Agric. Ind. neerl.*, 1908, **16**, 5).

Found in the Mascarene Islands, in dried parts of Ceylon and hills in south India.

PLUMERIA (*Apocynaceae*)

P. alba Linn.

Bark contains amyrin acetate, amyrin, β-sitosterol, scopoletin and plumieride (*Proc. Indian Acad. Sci.*, 1960, 173).

P. rubra Linn. var. *acutifolia* Bailey syn. *P. acutifolia* Poir.

Essen. oil from the flowers (yield 0·04-0·07%) (*Curr. Sci.*, 1957, **26**, 89).

Bark ext. yields amyrin, fulvoplumierin and plumieride (*Indian J. Pharm.*, 1961, **23**, 122).

PODOCARPUS (*Coniferae*)

***P. neriifolia** D. Don. syn. *P. polystachya* R. Br.

A decoction of the leaves used as an alterative in rheumatism and for painful joints.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Found from Nepal, Sikkim, Khasia Hills and forests of Burma, Andamans and the Malay Peninsula.

P. polystachya R. Br.; see **P. nerifolia** D. Don.

PODOPHYLLUM (*Berberidaceae*)

P. hexandrum Royle syn. *P. emodi* Wall. ex Hook. f. & Th.

Resin in leaves, 7·83-9·7%; maximum percentage in spring, suitable for collection (*J. Pharm., Lond.*, 1954, **6**, 625); resin contains essen. oil, podophyllotoxin, picropodophyllin and quercetin (*J. Amer. pharm. Ass.*, 1954, **43**, 614).

Separation and identn. of podophyllin by paper chromatography (*Acta chem. scand.*, 1954, **8**, 941). Dried rhizomes yield podophyllotoxin-β-D-glucoside which is said to inhibit mitosis and exerts a destructive action on cancerous tissues (*British Patent* 769,919, 1957). Roots and rhizomes yield α-lignan, a glycoside (*Helv. chim. acta*, 1964, **47**, 1205).

POGONATHERUM (*Gramineae*)

***P. crinitum** (Thunb.) Kunth

A paste or the ashes of the whole plant applied for skin diseases.

Found throughout India usually at lower elevations.

POGOSTEMON (*Labiatae*)

P. heyneanus Benth. syn. *P. patchouli* Hook. f.

Volatile oil, sesquiterpenes and glandular trichomes [*Pharmazie*, 1957, **12**(1), 38].

P. plectranthoides Desf.

Essen. oil, 0·7% yield from fresh leaves (*Saugar Univ. J.*, 1958, **7**, pt. II, Sect. A, No. 7, 49); Chem. compn. of the oil (*Indian J. Pharm.*, 1959, 38).

POLIANTHES (*Amaryllidaceae*)

P. tuberosa Linn.

Tubers on hydrolysis yield sapogenins, viz. hecogenin and tigogenin (*Japan Patent* 7927, 1956).

POLYGONUM (*Polygonaceae*)

P. aviculare Linn.

New use as a uterine substitute for ergot (*Biol. Abstr.*, 1959, 11435).

P. hydropiper Linn.

Flavonols and flavone glucoside determination, assay procedure (*Pharm. Zentralh.*, 1952, **91**, 291; *Chem. Abstr.*, 1953, 825 *g*). Glycoside D, quercitrin and glycoside E, hyperoside, isolation (*Arch. Pharm. Berl.*, 1954, **287**, 34; *Chem. Abstr.*, 1955, 570 *f*).

Flavonol glucoside increases in the plant till the first fruit begins to ripe and then decreases; maximum content in leaves, 9% (*Ziva*, 1959, **7**, 125; *Chem. Abstr.*, 1960, 3849 *h*).

A new sesquiterpene dialdehyde, polygodial, and its structure (*Aust. J. Chem.*, 1962, **15**, 322; *Chem. Abstr.*, 1963, 4603 *a*).

New use in blood stopping (*Biol. Abstr.*, 1959, 11435).

***P. minus** Huds.

A decoction of the leaves taken by the Malayans for indigestion and after childbirth.

Throughout the hotter parts of India from Kashmir to Assam and southwards to Travancore.

P. orientale Linn.

Contains new types of glycosides: orientosid and orientin (*Arch. Pharm. Berl.*, 1959, **292**, 380; *Biol. Abstr*, 1960, 57109).

P. persicaria Linn.

Plant ext. contains tannins, essen. oil, vitamin C and a glucoside, but no alks. nor saponins. A flavonoid glucoside, quercetin derivative, its isolation (*Uchen. Zap. pyatigorsk. gos. farm. Inst.*, 1959, **4**, 88; *Chem. Abstr.*, 1961, 23933 *b*).

***P. polystachyum** Wall. ex Meissn.

Dried herb yields rhamnazine, quercetin, quercitrin, isoquercitrin and quercetin-diglucoside besides polystachyoside [*Arch. Pharm. Berl.*, 1955, **288**(60), 489].

Found in tropical Himalayas from Mishmi to Kashmir and in Sikkim.

P. pulchrum Blume; see **P. tomentosum** Willd.

***P. tomentosum** Willd. syn. *P. pulchrum* Blume

Acts as a tonic; leaves eaten with food. Regarded as a means for purifying the blood.

Found in Bengal, Assam and Cachar and from Bombay to Malabar and Ceylon.

POLYPORUS (*Polyporaceae*)

P. officinalis Fries

Constituents—ergosterol and two C_{31}-triterpenoid acids [*Pharm. Zentralh.*, 1957, **96**(8), 478; *Biol. Abstr.*, 1958, 28446].

PONGAMIA (*Leguminosae*)

P. pinnata (Linn.) Merr. syn. *P. glabra* Vent.

Roots—four furoflavones, viz. keranjin, pongapin, pinnatin and gamatin;

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Seeds—pongapin; flowers—kaempferol and waxes; stem-bark—waxes (*Curr. Sci.*, 1964, 614).

PORTULACA (*Portulacaceae*)

P. oleracea Linn.

Used as diuretic, due to K_2O, in fresh plant 1% and dried plant 70% (*J. pharm. Soc. Japan*, 1944, **64**, 177; *Chem. Abstr.*, 1951, 823 *a*).

POTENTILLA (*Rosaceae*)

P. anserina Linn.

Pharmacological examination shows the presence of choline and succinic acid (*Arch. Pharm. Berl.*, 1954, 287, 392). The herb yields β-sitosterol, γ-sitosterol and two minor sterols [*Arch. Pharm. Berl.*, 1956, 289(61), 704; *Biol. Abstr.*, 1958, 27423].

P. fruticosa Linn.

Leaves yield triterpene and pure ursonic acid in 2% and 0·7% yields respectively (*Ann. pharm. franc.*, 1955, **13**, 169; *Chem. Abstr.*, 1955, 11959 *b*).

***P. fulgens** Wall.

Kumaon, Gar.–*Bajra-danti*.

Root—said to strengthen gums and teeth.

Found in Himalayan region; from Kunawar (alt. 1800-2000 m.) to Sikkim (alt. 200-400 m.); Khasia Mts.

POUZOLZIA (*Urticaceae*)

***P. viminea** Wedd.

An infusion of the roots used for haemorrhage in Java.

Found from Sutlej eastwards to Sikkim and from Assam to Tenasserim.

PRANGOS (*Umbelliferae*)

P. pabularia Lindl.

Investigations of alks. (*Dokl. Akad. Nauk. SSSR*, 1957, No. 7, 23; *Chem. Abstr.*, 1959, 3606 *f*). Chemical examination and preliminary pharmacological investigations of its compds. (*Indian J. Pharm.*, 1960, 238). Pharmacological actions of osthol, a natural coumarin from the roots; its respiratory stimulation as studied on dogs (*Arch. int. Pharmacodyn.*, 1962, **138**, 400; 1964; **147**, 351; 1964, **150**, 425).

Roots give coumarins: osthol 3·6%, peucedanin 0·8%, oxypeucedanin 3%, aviprin 1% and komalin 0·4%; umbels contain osthol 0·8%, isoimperatorin 0·02%, imperatorin 0·05%, bergapten 0·32% and heraclenin 0·18% (*Indian J. Chem.*, 1964, **2**, 464).

PRATIA (*Campanulaceae*)

***P. begonifolia** Lindl. syn. *P. nummularia* Benth. ex Kurz

Pounded leaves used by the Javanese for treating sprue.

Found in Nepal, Sikkim, Bhutan, Assam, Khasia Mts, and Pegu.

P. nummularia Benth. ex Kurz.; see **P. begonifolia** Lindl.

PREMNA (*Verbenaceae*)

***P. divaricata** Wall.

Fruits poisonous. Leaves eaten and leaf-poultices used for headache.

Found in Tenasserim and southwards to Singapore and Andamans.

***P. parasitica** Blume syn. *P. trichostoma* Miq.

Used medicinally for fever.

Found in Western Malaysia-Malacca, Tenasserim and Singapore.

***P. trichostoma** Miq.; see **P. parasitica** Blume.

PRISTIMERA (*Hippocrateaceae*)

P. indica (Willd.) A. C. Smith

Pristemerin, an antibacterial principle, active against Gram-positive bacteria; its chemistry (*Indian J. Pharm.*, 1953, **15**, 307); its chemical constitution and biological activity (*J. sci. industr. Res.*, 1955, **14C**, 1).

PROSOPIS (*Leguminosae*)

***P. juliflora** DC.

Gummosis, exudation of gum (*Sci. & Cult.*, 1961, 489).

Native of tropical America, naturalized in Punjab, Rajasthan, Agra and Delhi.

P. spicigera Linn.

Flowers yield a flavone glucoside, patulitrin (*Indian J. Chem.*, 1964, **2**, 83).

PRUNUS (*Rosaceae*)

P. amygdalus Batsch syn. *Amygdalus communis* Linn.

Almond oil component acids (*Chem. & Ind.*, 1952, 667).

P. cerasoides D. Don. syn. *P. puddum* Roxb. ex Wall.

Bark yields flavanone glucoside, sakuranin and chalcone glucoside, a neosakuranin (*J. Indian chem. Soc.*, 1950, **27**, 148; *J. sci. industr. Res.*, 1954, **13B**, 698).

P. domestica Linn. syn. *P. communis* Huds.

English–*Common garden plum*.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A new dihydroflavonol, named dihydrokaempferide, isolated from the heartwood (*J. sci. industr. Res.*, 1961, **20B**, 509).

P. undulata Buch.-Ham.

Seed oil yields α-elaostearic acid 22·4% (*Indian J. appl. Chem.*, 1964, **27**, 1).

PSIDIUM (*Myrtaceae*)

P. guajava Linn.

Essen. oil from Allahabad variety (yield 0·31%) contains *dl*-limonene (*Perfum. essent. Oil Rec.*, 1953, **44**, 46, 274). The plant yields β-sitosterol (*J. chem. Soc.*, 1954, 2782).

Constituents of guava pectin: *d*-galacturonic acid (72·03%), *d*-galactose (12·05%) and *l*-arabinose (4·40%) (*Sci. & Cult.*, 1960, 34).

Stem-bark used in indigenous medicine—variation in ellagic acid contents (*Indian J. Pharm.*, 1964, **26**, 140). Leaves contain β-sitosterol, maslinic acid (cratagolic acid), guijavalic acid and an unidentified acid (*Indian J. Chem.*, 1964, **2**, 377).

PSORALEA (*Leguminosae*)

P. corylifolia Linn.

Isopsoralidin, a new crystalline material from the seeds [*J. Mysore Univ.*, 1957, **17**(1), 31]. Raffinose isolation (*J. sci. industr. Res.*, 1961, **20B**, 135). Seed oil, antistaphylococcal fraction (*Indian J. Pharm.*, 1964, **26**, 141). Seed ext. inhibits the growth of *Staph. aureus* in 10 μg./ml. conc. A fraction. (b.p. 155°/0·3 mm.) inhibits the growth in 0·5 μg./ml. conc. (*Indian J. Pharm.*, 1964, 141).

PSYCHOTRIA (*Rubiaceae*)

***P. calocarpa** Kurz. syn. *P. viridiflora* Reinw. ex Kurz.

Leaves, bark and juice of the stem of the plant are used for skin complaints in the Malay Peninsula and in Java.

Found in Nepal, Sikkim, Upper Assam, Khasia Mts. and Cachar and Tenasserim.

***P. montana** Blume

Root used for poulticing ulcers and swellings; a hot lotion used for bathing the body in fever and for enlarged spleen.

Found in Assam plains from Gualpara to Suddya and Sylhet and Tenasserim.

***P. sarmentosa** Blume

Leaves used for poulticing sores, as a selusoh', or drug to expedite childbirth in Kuala Lipis.

Found widely from India (Canara southwards) to Malaya Archipelago.

P. viridiflora Reinw. ex Kurz.; see **P. calocarpa** Kurz.

PTERIDIUM (*Polypodiaceae*)

P. aquilinum (Linn.) Kuhn.

Astragalin and isoquercitrin isolated from the brackens (*Bull. agric. chem. Soc. Japan*, 1955, **19**, 104).

PTEROSPERMUM (*Sterculiaceae*)

***P. diversifolium** Blume

The bark is said to act as a fish poison.

Found in southern Carnatic and Malaya.

PUERARIA (*Leguminosae*)

***P. phaseoloides** Benth.

The plant used medicinally for ulcers and in boils in Malaya. A decoction is made for internal use and also as a poultice for children.

Found in north-eastern India, Malaysia and China.

P. tuberosa DC.

Used medicinally in villages; contains gluconic and malic acids [*Agra Univ. J. Res.*, 1960, 175].

PUNICA (*Punicaceae*)

P. granatum Linn.

Bark contains betulic acid, peel, ursolic acid and leaves both these compds. (*Pharm. Acta Helvet.*, 1954, **29**, 338; *Chem. Abstr.*, 1955, 5782 *d*).

Bark also contains four alks., pseudopelletierine, pelletierine, isopelletierine and methylpelletierine (*Rec. Trav. chim. Pays-Bas*, 1954, **73**, 102). In addition to these the bark contains three other basic components (*Koninkl. Ned. Akad. Wetenschap. Proc.*, 1955; **58**, 56; *Chem. Abstr.*, 1955, 10583 *e*).

Ext. of bark used as a tapeworm helminthicide; also effective in hymenolepidosis. Water ext. weaker than acetic acid ext. [*Med. Parasit. Moscow*, 1954 (4), 311; *Biol. Abstr.*, 1957, 29503]. Alk.: anthelmintic activity due to isopelletierine (*Arch. Biochem. Biophys.*, 1957, **69**, 27; *Biol. Abstr.*, 1958, 10040). Root bark— anthelmintic activity tested against *Taenia canina*, etc. (*J. Indian med. Res.*, 1963, **41**, 435).

PYRETHRUM (*Compositae*)

***P. cinerariifolium** Trev.; see **Chrysanthemum cinerariaefolium** Vis.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PYRUS (*Rosaceae*)

P. communis Linn. syn. *Pirus communis* Linn.

Fresh leaves contain tannins 0·8-2·9% (*Pharmazie*, 1958, **13**, 299). Dry leaves have 0·3-1·3% of ursolic acid (*Arch. Pharm. Berl.*, 1958, **291**, 308; *Chem. Abstr.*, 1958, 20894 *d*). Young foliage leaves yield a new phenolic compd. 'Compound U', which seems to be related to arbutin by its physiological behaviour (*Pharmazie*, 1960, **15**, 319; *Chem. Abstr.*, 1961, 5870 *c*).

***P. lindleyi** Rehd. syn. *P. sinensis* Lindl.; *P. ussuriensis* Maxim.

English–*The Chinese pear.*

H.–*Naspati.*

The dried rind used medicinally in the treatment of dysentery.

Met with widely in China and extending to the plains of upper India.

QUAMOCLIT (*Convolvulaceae*)

Q. pinnata (Desr.) Bojer. syn. *Ipomoea quamoclit* Linn.

The plant is used as purgative in Queensland for snake-bite and as a snuff.

The leaves and stems are reported to contain small amounts of alks. Leaves are cyanogenetic; traces present in roots, stems and flowers (*Bull. Coun. sci. industr. Res. Aust.*, No. 232, 1948, 42; *Chem. Abstr.*, 1950, **44**, 2180).

QUISQUALIS (*Combretaceae*)

Q. indica Linn.

English–*Chinese-Shikunshi.*

Fruits used as children's anthelmintic for ascaris in China; its chemical study (*J. pharm. Soc. Japan*, 1944, **64**, No. 7A, 8; *Chem. Abstr.*, 1961, 3564 *b*).

RANDIA (*Rubiaceae*)

R. dumetorum Lam.

From the powdered root, recovered scopoletin (*J. sci. industr. Res.*, 1959, **18B**, 175).

Dried fruits yield a micro-crystalline saponin named ursosaponin, as also β-sitosterol and a new triterpene. The drug has a high haemolytic index (*Indian J. Pharm.*, 1960, 120).

***R. malabaricum** Lam.

Powdered root yields scopoletin (*J. sci. industr. Res.*, 1959, **18B**, 175).

Found in the hills of Western Peninsula from Canara southwards.

RAPHANUS (*Cruciferae*)

R. sativus Linn. syn. *R. caudatus* Linn.

H.–*Moongra* (the edible part of the plant).

From the violet-red variety is isolated cynin and from the yellowish-red variety, pelargonin (*Chem. Abstr.*, 1921, 697). The pigment, the colouring matter of the whiplike purple coloured edible part of the plant is malvin chloride (*J. sci. industr. Res.*, 1959, **18B**, 243).

RAUWOLFIA (*Apocynaceae*)

R. canescens Linn. syn. *R. hirsuta* Jacq.

Roots are said to contain 0·8-1% of total alks. identical with 'alstonin'. These alks. produce hypotension and inhibit hypertension (*An. Soc. Biol. Bogota*, 1954, **6**, 27; *Chem. Abstr.*, 1954, 12373 *c*; *Arch. int. Pharmacodyn.*, 1954, **98**, 273; *Chem. Abstr.*, 1955, 1277 *i*). Alks. reserpine, rauwolscine and alstonine are found in roots (*J. Amer. chem. Soc.*, 1955, **77**, 1861); identn. of some of the rauwolfia alks. by papyrographic analysis (*Indian J. Pharm.*, 1955, 91). Rauwolscine (α-yohimbine); its structure (*J. Indian chem. Soc.*, 1959, **36**, 685).

Isolation of alks. yohimbine, serpentine and raubasine from the roots (*Naturwissenschaften*, 1954, **41**, 479). Alks. raupine, ajmaline, reserpinine and ajmalicine are also present (*Naturwissenschaften*, 1955, **42**, 391). Isolation of isomeric alks., raunescine and isoraunescine (*J. Amer. pharm. Ass.*, 1955, **44**, 639). Isolation of serpentine from the roots (*Indian J. Pharm.*, 1958, **20**, 69) as also serpine and ajmaline (*Naturwissenschaften*, 1958, **45**, 365). Structure and stereochemistry of rauwolscine (α-yohimbine) (*J. Indian chem. Soc.*, 1959, **36**, 685).

Leaves yield two new indole alks. isoreserpiline and isoreserpinine (*Soc. biol. Chem. India, Silver Jubilee Souvenir*, 1955, 248; *Chem. Abstr.*, 1951, 669 *g*).

Synthesis of reserpine analogue from rauwolscine possessing hypotensive activity equal to reserpine (*J. sci. industr. Res.*, 1955, **14C**, 237).

***R. decurva** Hook. f.

Roots of *R. decurva* yield alks. reserpiline, isoreserpiline, reserpine and sarpagine and probably rescinnamine, reserpinine and two others, but no ajmaline (*J. Amer. pharm. Ass.*, 1959, **48**, 37).

Found wild in the Deccan Peninsula, Canara and the Konkan; Poona.

***R. densiflora** Benth. ex Hook. f.

The roots yield two resins, basic and non-basic; from the former can be isolated ajmaline and reserpine (*Naturwissenschaften*, 1955, **42**, 182; *Chem. Abstr.*, 1956, 5239 *e*; *J. sci.*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

industr. Res., 1955, **14B**, 2478); identn. of some of the Rauwolfia alks. by papyrographic analysis (*Indian J. Pharm.*, 1955, 91). Isolation of sarpagine and reserpinine from the roots (*J. sci. industr. Res.*, 1962, **21B**, 454).

Found in Khasi Hills and on the Western Ghats.

R. hirsuta Jack; see **R. canescens** Linn.

***R. micrantha** Hook. f.

Reserpine occurs in *R. micrantha* and some other Rauwolfia species (*Chem. Engng News*, 1955, **33**, 1074). From the oleoresins from *R. micrantha* are obtained four bases, and of these one is identical with reserpine and another identical with ajmalicine (*J. Amer. pharm. Ass.*, 1955, **44**, 253). Identn. of some of the Rauwolfia alks. by papyrographic analysis (*Indian J. Pharm.*, 1955, 91). Constitution of sarpagine (*Sci. & Cult.*, 1957, 692).

Found in Kerala State.

R. serpentina Benth. ex Kurz.

Root—hypnotic, sedative; used in neuropsychiatric disorders, psychoses, schizophrenia and epilepsy, high blood pressure, painful affections of bowels; decoction employed in labours to increase uterine contractions.

Total alks. from root 2-3%, root bark up to 4·13%, stem and leaves, *c.* 0·5%.

Roots from Assam, Bihar, Kerala, Orissa and U.P. yield ajmaline fraction 13·3-18·9% (West Bengal var. 6·6, M.P. var. 27·2%) and oleoresin fraction containing reserpine 12-16% (West Bengal var. 9·9%) of the total alcoholic ext.

Therapeutical preparations of *R. serpentina* are variously based on total root powder, root-bark, total ext., total alks., pure alks. alone or in admixture with other drugs.

Reserpine, isolated from the resinous fraction, is a weakly basic indoline alk. with a carboxylic ring E (*Chem. Abstr.*, 1963, **59**, 6459); of about 80 alks. present in *Rauwolfia* spp., it is the most important therapeutic principle and is present in almost all species; it is commercially produced from *R. serpentina*, *R. micrantha*, *R. tetraphylla* and *R. vomitoria*, the first three occurring in India (Kirk & Othmer, 1963, **1**, 800); about 20 alks. have been isolated from *R. serpentina*, other important alks. besides reserpine, are reserpinine, ajmaline, sarpajmaline, ajmalicine and serpentine.

Reserpine is a central depressant, sedative, hypotensive with bradycardia; its effect in doses adjusted to individuals (0·05-2·0 mg. daily) is slow on onset, becomes cumulative and continues for some time after withdrawal; parenteral therapy is resorted to when oral administration is impracticable; reserpine is most valuable in younger patients with mild labile hypertension associated with tachycardia; in older cases it is used with more potent hypotensives. It is used as sedative in mild anxiety states and chronic psychoses; it is rather a tranquillizer producing less somnolence than barbiturates; in severe muscular injection it should be given with caution in anxiety, depressive states, cardiac arrythmia, myocardial infarction, bronchitis or gastric ulcer. It has a relatively low toxicity commonly producing nasal congestion, peculiar dreams, vertigo, gastrointestinal upsets, which are usually transient; reserpine is not habit-forming (B.P.C., 1963, 704).

Deserpidine which differs from reserpine by the absence of a methoxyl group in ring A (*Chem. Abstr.*, 1959, 20504), modifies the hypophysogenital system of the rat; in female it suppresses vaginal keratinization, induces permanent estrus and stimulates mammary gland; in male it dissociates the germinal and endocrine functions of testicles.

Reserpinine has hypotensive sedative bradycardiac activity similar to that of reserpine (*J. Amer. chem. Soc.*, 1954, **76**, 2843).

Ajmaline, an indoline alk. of medium basicity, may be used in hypertension complicated by a cardiac condition in combination with other hypotensive agents (*Nature, Lond.*, 1963, **200**, 1067).

Sarpajmaline, an alkaloidal complex, is much more potent hypotensive than reserpine without sedative and central depressant action of the latter (*Pakist. J. sci. industr. Res.*, 1959, **93**, 114).

Ajmalicine is a central depressant and adrenergic blocking agent (*Chem. Abstr.*, 1957, 12326).

Serpentine is the major yellow anhydronium base of *R. serpentina* (*Chem. Abstr.*, 1963, **59**, 6459), it is twice as hypotensive as ajmaline (*J. sci. industr. Res.*, **13B**, 77); shows synergistic activity when administered with reserpine (*Indian J. med. Res.*, 1959, **47**, 419).

Rauvolfias are found practically all over the country especially in Himalayan terrain, Bihar and Bengal up to an alt. of 1200 m.; cultivation is attempted in U.P., Rajasthan, Gujarat and Maharashtra.

RHAZYA (*Apocynaceae*)

R. stricta Decne.

An indole alk. rhazine and its structure (*J. sci. industr. Res.*, 1962, **21B**,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

147). Rhazidine, a minor alk. (*Indian J. Chem.*, 1963, **1**, 95; 363).

RHEUM (*Polygonaceae*)

Rutin has been isolated from Rheum species—*R. emodi* Wall. of Himalaya regions, 0·32%; *R. officinale* Baill of Tibet, 1·30%; *R. pruinosum*, 3·10%; *R. rhaponticum* Linn. of Siberia, 0·16% and *R. undulatum* Linn. of Central Asia, 0·70% (*Arch. Pharm. Berl.*, 1954, **287**, 126).

R. emodi Wall.

The hetrodianthrones sennidin C, reidin B and reidin C from fresh rhubarb roots (*Pharm. Weekbl.*, 1964, **99**(23), 613; *Chem. Abstr.*, 1964, **61**, 13125 *e*).

R. palmatum Linn.

English–*Sorrel rhubarb*; *Rhizoma rhei*.

Pharmacognostic studies (*Pharmazie*, 1956, **11**, 138; *Chem. Abstr.*, 1957, 8364 *h*). Anthracene derivatives (*Biul. Inst. Rosl. leczn.*, 1957, **3**, 202; *Chem. Abstr.*, 1958, 2344 *d*, *c*). Reidin A, a new dianthrone (anthraquinone drug) from roots (*Pharm. Weekbl.*, 1963, **98**(17), 655; *Chem. Abstr.*, 1964, **60**, 365 *f*).

RHODAMNIA (*Myrtaceae*)

***R. trinervia** Blume

A decoction of leaves and roots is used after childbirth as a protective medicine; and for stomachache.

Found from Tenasserim and the Andaman Islands to Australia.

RHODODENDRON (*Ericaceae*)

Tinctures and exts. of Rhododendron species—*R. chrysanthum* Pall., *R. ponticum* Linn., *R. flavum* G. Don. and *R. dauricum* Linn., have cardiac effects on cats like those of digitalis glucoside (*Farmak. Toks.*, 1956, **19**, 39; *Chem. Abstr.*, 1956, 11616 *f*).

R. arboreum Sm. syn. *R. cinnamomeum* Wall. and *R. nilagiricum* Zenk.

Chemical examination of leaves (*Proc. Indian Acad. Sci.*, 1959, **50A**, 366; 1961, **54A**, 99). Chemical examination of flowers (*Proc. Indian Acad. Sci.*, 1960, **51A**, 322).

R. barbatum Wall. ex G. Don.

Leaves contain campanulin and ursolic acid hyperoside (*J. sci. industr. Res.*, 1961, **20B**, 544).

R. campanulatum D. Don.

Chemical examination of leaves (*Proc. Indian Acad. Sci.*, 1961, **53A**, 98).

R. cinnamomeum Wall.; see **R. arboreum** Sm.

***R. decipiens** Lacaita

Chemical constituents of leaves; campanulin and friedelin, ursolic acid and quercetin (*J. sci. industr. Res.*, 1961, **20B**, 61).

Temperate regions of Himalayas up to Darjeeling, 3000-3300 m.

R. falconeri Hook. f.

Chemical examination of leaves (*Proc. Indian Acad. Sci.*, 1957, **46A**, 245).

R. nilagiricum Zenk.; see **R. arboreum** Sm.

***R. thomsonii** Hook. f.

A poisonous principle, acetylandromedol (andromedotoxin), isolated from the drug (*J. Pharm., Lond.*, 1959, **11**, Suppl. 269 T).

East Nepal and Sikkim.

RHODOMYRTUS (*Myrtaceae*)

***R. tomentosa** Wight

Nilgiris–*Thaontay*.

The fruit is used by the Malays as a medicine for curing diarrhoea.

Found in Western Peninsula; Pulney Hills; Nilgiris; Ceylon; Malacca; Singapore and Penang.

RHUS (*Anacardiaceae*)

***R. cotinus** Linn. syn. *Cotinus coggygria* Scop.

H.–*Batra*; P.–*Tung*; Kumaon–*Jaltunga*; Kash.–*Chariant*.

Leaves ext. yield 2 derivatives of gallic acid and 3 flavonoid compds., one being the methyl ester of gallic acid (*Arch. Pharm. Berl.*, 1958, **291**(6), 269; *Biol. Abstr.*, 1959, 23389).

Found in Western Himalayas from Murree to Kumaon.

R. succedanea Linn.

Leaves give a new glycoside, apigenin (*Arch. Biochem. Biophys.*, 1952, **37**, 85; *Chem. Abstr.*, 1953, 825 *b*).

RIBES (*Saxifragaceae*)

R. nigrum Linn.

English–*Black currant*.

Essen. oil from the leaves, yield 0·02%; its composition (*J. Sci. Fd Agric.*, 1953, **14**, 834; *Chem. Abstr.*, 1964, **60**, 7867 *e*).

RICINUS (*Euphorbiaceae*)

R. communis Linn.

Castor oil congeals to a gel-mass when the alcoholic solution is distilled in presence of sodium salts of higher fatty acids. This gel is useful in dermatosis and is a good protective in occupational eczemas and dermatitis

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(*Pharmazie*, 1960, **15**, 120; *Chem. Abstr.*, 1960, 16743 *c*). Modification of dehydrated castor oil with styrene (*J. sci. industr. Res.*, 1961, **20B**, 65).

RIVEA (*Convolvulaceae*)

***R. corymbosa** Hallier f.; see **Ipomoca burmanni** Choisy

ROCCELLA (*Roccellaceae*)

***R. montagnei** Bel.

This lichen is commonly used as a fodder in South India.

Isolation of ergosterol (*J. sci. industr. Res.*, 1959, **18B**, 91). Arid isolation of carotene (*J. sci. industr. Res.*, 1959, **18B**, 162). Amino acids found: leucine, valine, tyrosine, alanine, glycine, threonine and arginine besides lysine, phenylalanine and serine (*Indian J. Chem.*, 1964, **2**, 467).

ROSA (*Rosaceae*)

R. borboniana Desp.; see **R. indica** Linn.

R. brunonii Lindl.; see **R. moschata** Herrm.

R. centifolia Linn.

Essen. oil distilled from the petals of flowers grown in Calabria (Italy) = 0·011-0·43%; chem. compn. (*Essenze*, 1957, **27**, 83; 1958, **28**, 157; *Chem. Abstr.*, 1958, 3269 *g*).

R. damascena Mill.

English–*Damask rose*.

Essen. oil from Bulgaria contains citronellol 45·51% (*C.R. Acad. bulg. Sci.*, 1954, **7**, No. 1, 131); otto of rose from plants grown in Kanpur (*Indian Soap J.*, 1955, **21**, 61); fractionation yields 1% ketone (*Parfum. cosmet. Savons*, 1960, **3**, 319; *Chem. Abstr.*, 1960, 25595 *g*). Spectrophotometric determination of geraniol in rose oil (*Riechstoffe Aromen*, 1962, **12**, 285; *Chem. Abstr.*, 1963, 2320 *h*).

Rose flowers handled 4-5 hours after picking maintain entire quantity of their oil if preserved in 20% NaCl solution (*Chem. Abstr.*, 1955, 5782 *a*).

R. indica Linn. syn. *R. borboniana* Desp.; *R. chinensis* Jacq.

Essen. oil from fresh flowers, yield 0·013-0·15%; composition: *l*-citronellol 23·89, geraniol 12·78, phenethyl alc. 16·36, stearoptenes 22·1% (*Indian Perfumer*, 1959, **3**, pt. 2, 81).

R. multiflora Thunb. syn. *R. polyantha* Sieb. & Zucc.

Fruits give fatty oil (9·4%); phytosterol, triterpenoid, quercetin and α-carotene are present in the pericarp (*J. pharm. Soc. Japan*, 1951, **71**, 1281; 1952, **72**, 556; *Chem. Abstr.*, 1952, 2755 *f*; 9264 *b*). Multiflorin, a flavonic glucoside having weak cathartic effects, is also present (*Ann. Rep. Tokyo Coll. Pharm.*, 1954, **4**, 270; *Chem. Abstr.*, 1955, 9228 *d*).

R. polyantha Sieb. & Zucc.; see **R. multiflora** Thunb.

ROSCOEA (*Zingiberaceae*)

R. procera Wall.; see **R. purpurea** Sm.

R. purpurea Sm. syn. *R. procera* Wall.

H.–*Safedmusli*.

Roots—tuberous tonic used in seminal debility. Used medicinally in villages; contain citric, malic and succinic acids (*Agra Univ. J. Res.*, 1960, 175).

ROSMARINUS (*Labiatae*)

R. officinalis Linn.

English–*Rosemary oil*.

Essen. oil, yield 0·8%; composition: free borneol 18·8, bornyl acetate 17·1, camphor 9·8, cineole 9·2 and terpenes 44% (*R.C. Semin. Sci. Cagliari*, 1946, **16**, 201; *Chem. Abstr.*, 1951, 4001 *b*).

ROSTELLULARIA (*Acanthaceae*)

R. procumbens (Linn.) Necs; see **Justicia procumbens** Linn.

RUBIA (*Rubiaceae*)

R. tinctorum Linn.

Determination of anthraglycosides in the dry ext. (*Med. Prom. SSSR*, 1960, **14**, No. 10, 38; *Chem. Abstr.*, 1961, 6783 *f*).

RUBUS (*Rosaceae*)

R. alcaefolius Poir.; see **R. moluccanus** Linn.

R. moluccanus Linn. syn. *R. alcaefolius* Poir.

The plant has medicinal uses.

Found throughout Central and Eastern tropical and temperate Himalayas; Western Peninsula or the ghats from Bombay southwards.

RUMEX (*Polygonaceae*)

R. acetosa Linn.

Hyperoside (quercetin-3-D-galactoside) from dried leaves, yield 0·05% (*Arch. Pharm. Berl.*, 1955, **288**, 58; *Chem. Abstr.*, 1956, 12403 *b*).

R. crispus Linn.

Causes irritation of the skin and mucous membranes, also of the digestive

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

system (*Arch. Inst. Biol.*, 1959, **55**; *Biol. Abstr.*, 1961, 35301).

R. nepalensis Spreng.
Kumaon–*Bhilmora*.
Leaves used in colic.

RUNGIA (*Acanthaceae*)

R. repens Nees
Flowers give two glycosides of luteolin (*Indian J. Chem.*, 1964, **2**, 338).

RUTA (*Rutaceae*)

R. graveolens Linn.
Investigations on photodynamically active coumarin derivative, bergapten; yield 1·2% (*Gazz. chim. ital.*, 1954, **84**, 874; *Chem. Abstr.*, 1955, 7188 *d*). Alk. graveoline, from the Hong Kong medicinal herb; 0·002% yield. Kokusaginine and skimmianine also occur in the Japanese variety (*Aust. J. Chem.*, 1960, **13**, 510; *Chem. Abstr.*, 1961, 8766 *g*). Synthesis of graveolinine (*Chem. & Ind.*, 1962, 1982).
Oil of Ruta in Dalmatia [*Acta pharm. jugosl.*, 1959, **9**(1), 9].
Seasonal variation of essen. oil in different parts (*Acta polon. pharm.*, 1962, **19**, 497; *Chem. Abstr.*, 1964, **60**, 15677 *b*).

SACCOPETALUM (*Anonaceae*)

***S. tomentosum** Hook. f. & Th.
H.–*Kirna*; Oriya–*Patmossu*; M.–*Humb*; Tel.–*Chilkadudu*; Kan.–*Hessare*.
Essen. oil from fruit; yield 0·23% (*Riechstoffe Aromen*, 1962, **12**, 357; *Chem. Abstr.*, 1963, 4371 *a*).
Found in the *terai* of Nepal, at Gorakhpur, Orissa and Bihar and from Konkan to Travancore.

SALACIA (*Celastraceae*)

***S. prinoides** DC.
Roots astringent. A decoction of roots used for amenorrhoea and dysmenorrhoea; considered to bring about abortion.
Sylhet and the Khasia Mts. and Eastern and Western Peninsula.

SALOMONIA (*Polygalaceae*)

***S. cantoniensis** Lour.
The plant is pulped and rubbed about the mouth for sprue in children.
Eastern Bengal, Assam, Khasia Mts. and Eastern Peninsula.

SALVIA (*Labiatae*)

S. officinalis Linn.
Essen. oil increases in yield by air-drying (*Pharmazie*, 1949, **4**, 573; *Chem. Abstr.*, 1961, 1304 *h*); its variation in various parts (*Ann. pharm. franc.*, 1952, **10**, 428). Essen. oil and its cineole content highest in the efflorescence; up to 25% cineole in the fresh dried shoots (*Dissnes pharm., Warsz.*, 1960, **12**, 211; *Chem. Abstr.*, 1961, 6286 *i*). Essen. oil constituents (*Ann.*, 1964, **676**, 171; *Chem. Abstr.*, 1964, **61**, 14463 *c*).
Picrosalvin, a bitter substance isolated from the leaves, has a bacteriostatic effect on several organisms (*Dtsch. Apoth-Ztg.*, 1958, **98**, 651; *Chem. Abstr.*, 1961, 6786 *b*). Structure of picrosalvin (*Chem. Ber.*, 1962, **95**, 3034; *Chem. Abstr.*, 1963, **58**, 7980 *f*). Diterpene and picrosalvin from the plant (*Helv. chim. acta*, 1964, **47**, 1234).
Resin bodies, their properties and constants (*Pharmazie*, 1958, **13**(10), 647; *Biol. Abstr.*, 1959, 27388).

SAMADERA (*Simarubaceae*)

S. indica Gaertn.
Constituents of the bark, taraxerone, stigmastanone and stigmasterol (*Bull. Soc. chim. Fr.*, 1962, 171521; *Chem. Abstr.*, **58**, 1963, 6888 *h*).

SAMBUCUS (*Caprifoliaceae*)

S. ebulus Linn.
New use in medicine for curing neuralgia (*Biol. Abstr.*, 1959, 11435).

S. nigra Linn.
New use of the plant as a sudorific (*Biol. Abstr.*, 1959, 11435).

SANDORICUM (*Meliaceae*)

***S. indicum** Cav.
A decoction of leaves given for diarrhoea. Pulped leaves applied to the skin for itch.
From Rangoon and Tenasserim to Penang. Introduced in the Western Peninsula.

SANTALUM (*Santalaceae*)

S. album Linn.
Essen. oil from sandalwood from Timor island; yield 4%. It is superior to the Mysore oil (*Ather. Ole.*, 1952, **2**, 273). α- and β-Santalenes, isolated by fractionating the Indian sandalwood oil through packed columns and batch-strip head (*Perfum. essent. Oil Rec.*, 1956, **47**, 353).
Fruits yield betulic acid, β-sitosterol and a fatty oil (*Indian J. Chem.*, 1964, **2**, 82).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

SAPINDUS (*Sapindaceae*)

S. mukorossi Gaertn.
Fruits yield substances toxic for zenopus larvae and hemolysing blood; xenopus index and hemolytic index 7000 (*J. Pharm., Lond.*, 1960, **12**, 631); physiologically active saponin in 22% yield (*Aptech. Delo*, 1960, No. 5, 23; *Chem. Abstr.*, 1961, 10799 *i*).

S. obovatus Wight & Arn.; see **Blighia sapida** Kon.

S. rarak DC.; see **Dittelasma rarakа** Hook f.

SAPROSMA (*Rubiaceae*)

***S. ternatum** Benth. & Hook. f.
The Malayans eat the leaves for flatulence and use as poultice after childbirth troubles.
Found in Mishmi and Bhutan and Khasia Mts. and Andamans.

SARACA (*Leguminosae*)

S. indica Linn.
Isolation of a ketosterol, a glycosidal fraction, a saponin and an org. calcium compd. from the whole plant—ketosterol and the calcium salt important in the treatment of menorrhagia (*Curr. Sci.*, 1963, **32**, 502; *Indian J. Pharm.*, 1964, **26**, 110).

SARCOCOCCA (*Euphorbiaceae*)

***S. pruniformis** Lindl.
Kumaon–*Sukat sing*.
Extensively used as a febrifuge and in rheumatism.
Leaves contain a crystalline alk. and a non-nitrogenous compd. (*Indian J. Pharm.*, 1951, **13**, 129). A neutral constituent identified as betulin (*J. sci. industr. Res.*, 1962, **21B**, 459).
North-west Himalayas, 2500-3000 m.; wild in Kashmir; Western Ghats from Kanara southwards.

SARCOLOBUS (*Asclepiadaceae*)

***S. globosus** Wall.
B.–*Baoli-lata*.
The plant, particularly the seeds, used for poisoning wild animals like tiger and wild hogs. Sometimes criminally used by thieves to kill watch-dogs. The poisonous substance is a resin.
The leaves recommended in a paste made with Aleuritis nuts, for rubbing on the joints in what may be either rheumatic fever or *dengue* fever.
Found about the edge of mangrove swamps from the Sundarbans of Bengal to Western Malaysia and Nicobar Islands.

SAROTHAMNUS (*Leguminosae*)

***S. scoparius** Koch; see **Cytisus scoparius** Link.

SATUREJA (*Labiatae*)

S. hortensis Linn.
Essen. oil of the herb during vegetative period, 0·97-0·98% [*Pharmazie*, 1958, **13**(3), 148; *Biol. Abstr.*, 1958, 41936].

SATYRIUM (*Orchidaceae*)

***S. nepalense** D. Don
H.–*Salabmisri*
Pseudobulbs are used in tonic preparations.
Found from Kashmir, alt. 1000-2500 m. eastwards,a scending to 4000 m. in Sikkim, Khasia Mts.; the Deccan, from Konkan to Travancore.

SAUROPUS (*Euphorbiaceae*)

***S. albicans** Blume syn. *S. androgynus* Merrill.
Khas.–*Dieng-soh-pit*.
A decoction of the roots given for fever and for stricture of the bladder. Pounded roots and leaves are used for poulticing.
Sikkim, Sylhet and the Khasia Mts. and Burma.

SAUSSUREA (*Compositae*)

S. lappa C. B. Clarke
Roots contain a new lactone, saussurea lactone (20-25% yield) (*J. sci. industr. Res.*, 1951, **10B**, 166). Composition of terpenes of costus oil (*Chem. Listy*, 1958, **52**, 169; *Chem. Abstr.*, 1959, 1642 *e*). Examination of costus roots (*Perfum. essent. Oil Rec.*, 1963, **54**, 301).

SAXIFRAGA (*Saxifragaceae*)

***S. diversifolia** Wall.
Used medicinally in villages; contains tartaric and malic acids (*Agra Univ. J. Res.*, 1960, 175).
From Kashmir to Bhutan; in the Kumaon region, 3000-5000 m.

SCHLEICHERA (*Sapindaceae*)

S. oleosa (Lour.) Merr. syn. *S. trijuga* Willd.
Kusum oil; yield 58-60% in kernels; fatty acid composition (*Indian Oil Soap J.*, 1964, **29**, 243).

SCILLA (*Liliaceae*)

S. indica Baker
Chemical components of fresh bulbs (*J. sci. industr. Res.*, 1955, **14B**, 131).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

SCINDAPSUS (*Araceae*)

S. officinalis Schott
Fruits yield a sterol, an oil, sugars and two glucosidic colouring matters, scindapsin A and B (*J. sci. industr. Res.*, 1959, **18B**, 427).

SCLERIA (*Cyperaceae*)

***S. levis** Retz.
Fruits good for cough; eaten in the betel-quid.
From Assam to Singapore; Nicobars.

***S. lithosperma** SW.
A decoction of the roots administered after childbirth.
Throughout India except the west arid zone; common from Sikkim to Ceylon; Andamans and Nicobars.

SCOPARIA (*Scrophulariaceae*)

S. dulcis Linn.
White silky needles of crude alks.; 1·6% yield (*Arch. Farm. Bioquim. Tucuman*, 1955, **7**, 1; *Chem. Abstr.*, 1956, 16033 *e*).

SCOPOLIA (*Solanaceae*)

S. anomala (Link & Otto) Airy-Shaw syn. *S. lurida* Dunal.
Raised in Polish climate, *S. lurida* is richer in tropeine alks. than *A. belladonna* and is the richest European source (*Acta polon. pharm.*, 1956, **13**, 487; *Chem. Abstr.*, 1957, 837). Stems and leaves contain 0·32% alks., mostly hyoscyamine and roots 1·9% not more than 0·5% hyoscyamine (*Pharm. Weekbl.*, 1957, **92**, 547; *Chem. Abstr.*, 1957, 18483 *a*). Isolation of tropine alks., 2% yield (*Acta polon. pharm.*, 1958, **15**, 355; *Chem. Abstr.*, 1959, 5590 *g*). With the maturity of the plant, the total alks. increase particularly in the roots; during the early growth *l*-hyoscyamine and atropine on isolation remain in the liq. mixture while at the end of the growth, these come in the crystalline mixture (*Chem. Abstr.*, 1962, 1527 *a*).

S. lurida Dunal; see **S. anomala** (Link & Otto) Airy-Shaw.

SCUTELLARIA (*Labiatae*)

***S. discolor** Colebr.
Used for pains in the loins in western Java.
Subtropical Himalayas from Kumaon to Assam, Khasia Mts. and Malabar Ghats.

S. galericulata Linn.
This herb and also *Stachys betonica* Bentha. have some physiological action on human system but need more detailed study (*Biol. Abstr.*, 1959, 11434).

SCYPHIPHORA (*Rubiaceae*)

***S. hydrophyllaceae** Gaertn. f.
A warm ext. of the leaves used for stomachache.
Mangrove swamps on the Carnatic coast and Andaman Islands and Ceylon.

SECAMONE (*Asclepiadaceae*)

S. villosa Blume; see **Toxocarpus villosus** Decne.

SECURINEGA (*Euphorbiaceae*)

***S. suffruticosa** (Pall.) Rehder.
Yields securinin, a new therapeutic agent useful in the treatment of paresis, following infectious diseases (*Med. Prom. SSSR*, 1957, **11**, 54; *Chem. Abstr.*, 1958, 6724 *a*). Chemistry of securinine, the alk. of the roots [*Naturwissenschaften*, 1963, **50**(5), 55; *Chem. Abstr.*, 1963, 2884 *f*]. Suffruticodine, a new alk. (*Zh. obshch. Khim.*, 1963, **33**, 693; *Chem. Abstr.*, 1963, **59**, 2884 *h*). Isolation of alk. allosecurinin (*J. Indian chem. Soc.*, 1964, **41**, 163).
Madagascar. Grown in Bongo, North Bengal.

SELINUM (*Umbelliferae*)

***S. viginatum** C. B. Clarke
Essen. oil from dry roots; yield 1·54% (*Riechstoffe Aromen*, 1963, **13**, 181; *Chem. Abstr.*, 1964, **60**, 9731 *c*).
North-west Himalayas, from Kashmir to Kumaon, alt. 1800-3600 m.

SEMECARPUS (*Anacardiaceae*)

***S. anacardium** Linn. f.
Kernel oil, fatty acid composition (*Indian J. appl. Chem.*, 1964, **27**, 93).

***S. heterophylla** Blume
The most poisonous species; the poison is due to the resin oozing from cuts. Falling on the skin causes itch and swelling and heals with difficulty.
Tenasserim or Andaman Islands.

SENECIO (*Compositae*)

***S. chrysanthemoides** DC.
Reported to be poisonous to cattle. Alkaloidal constituent, seneciophylline (*Curr. Sci.*, 1964, 585).
Found in temperate parts, from Kashmir to Sikkim and Khasia Mts.

S. jacobaea D. Don.
Isolation and identn. of alks. seneciophylline, jacobine, jaconine, jacoline, jacozine, and senecionine (*Aust. J. Chem.*, 1954, 378; *Chem. & Ind.*, 1956, 1236).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The species cause senecciosis in cattle in Norway [*Blyttia*, 1939, **16**(4), 170; *Biol. Abstr.*, 1959, 31229].

***S. nudicaulis** Ham.
Alkaloidal component, 0·05% yield (*Curr. Sci.*, 1964, 81).
Found in temperate area from Waziristan to Sikkim, abundant in Kashmir.

SESBANIA (*Leguminosae*)

S. aculeata Pers.; see **S. bispinosa** (Jacq.) W. F. Wight.

S. bispinosa (Jacq.) W. F. Wight. syn. *S. aculeata* Pers.
H.–*Daincha*.
Leaves much used in poultices in India. Seeds are stimulant, emmenagogue and astringent.
Acid and a neutral sapogenin of the seeds (*J. sci. industr. Res.*, 1962, **21B**, 401).

***S. speciosa** Taub. ex Engl.
Seeds give mixture of saponins, which on hydrolysis yield β-sitosterol (stigmasterol) and oleanolic acid, an acid genin (*Indian J. Chem.*, 1964, **2**, 376).
Indigenous to Africa, found in Kerala in India.

SESELI (*Umbelliferae*)

S. indicum W. & A.
Powdered seeds yield an essen. oil, 2·5% (*Curr. Sci.*, 1953, **22**, 46). Composition: *d*-limonene 47% in low boiling fraction and selinene in high boiling fraction (*Perfum. essent. Oil Rec.*, 1959, **50**, 31).

***S. sibiricum** Benth.
Essen. oil, yield 0·6% (*Perfum. essent. Oil Rec.*, 1962, **53**, 607).
Kashmir, Kishtwar and West Tibet.

SETARIA (*Gramineae*)

S. italica Beauv.
English–*Italian millet*.
Enzymic liberation of essential amino acids from the proteins slower than from casein and wheat [*J. postgrad. Med.*, 1961, **7**(4), 158].

SILYBUM (*Compositae*)

S. marianum (Linn.) Gaertn.
Analysis of a commercial sample: volatiles, ash, water exts., alcoholic exts., crude fibre, fatty oil, total nitrogen and non-proteins (*Pharmazie*, 1952, **7**, 101; *Chem. Abstr.*, 1952, 10549 *b*).

SIUM (*Umbelliferae*)

***S. latifugum** C. B. Clarke
Dry leaves and fruits yield 0·94 and 5·5% of sweet-smelling oil (*Perfum. essent. Oil Rec.*, 1964, **55**, 391).
Found in the inner valleys of N.W. Himalayas (1500-3000 m.).

SKIMMIA (*Rutaceae*)

S. laureola Sieb. & Zucc. ex Walp.
Besides skimmianine, the leaves contain isopimpinellin, umbelliferone and laureoline (*J. Indian chem. Soc.*, 1933, **30**, 33). Isolation of scopoletin (0·035%), skimmin (0·50%) and umbelliferone (0·04%) from the trunk-bark (*J. Indian chem. Soc.*, 1960, 420).

SMILAX (*Liliaceae*)

***S. aspera** Linn. var. **mauritanica**
Source of steroids. The plant contains sarsapogenin and tiogenin (*An. Real Soc. Espan. Fis. Quim*, 1960, **56B**, 797; *Chem. Abstr.*, 1961, 23944 *c*).
Europe and India throughout.

SMITHIA (*Leguminosae*)

S. sensitiva Ait.
The whole plant boiled and eaten cold for difficulty in micturition and for gravel.

SOLANUM (*Solanaceae*)

S. dulcamara Linn.
The plant contains alks. α-, β-, and γ-soladulcine (*Plant. Med.*, 1958, **6**, 94; *Chem. Abstr.*, 1958, 14969 *a*), and soladulcinine, a new alk. (*Acta chim. hung.*, 1957, **12**, 31; *Chem. Abstr.*, 1958, 4101 *b*).

S. indicum Linn.
Fruits contain 1·8% of alks. and can form a good source material for cortisone and sex hormone preparations (*Indian J. Pharm.*, 1958, 247).

***S. khasianum** Clarke
Berries yield 0·7% of solasonine (*Indian J. Chem.*, 1964, **2**, 424).
Khasia Mts. Assam.

S. nigrum Linn.
The plant growing in Azerbaidzhan yields alk. 0·04%, glycosides 1·8%, etc. Effects of its galenic preparations upon central nervous system and reflexes of spinal cords (*Izv. Akad. Nauk-azerb. SSR*, 1952, No. 10, 61; *Chem. Abstr.*, 1956, 17332 *g*).
Isolation of alk. solamargine (*Acta chem. scand.*, 1958, **12**, 358; *Chem. Abstr.*, 1959, 9569 *f*).
Oil in berries 4·4% and in the seeds 18-22% (*Trudy bot. Inst. Akad. Nauk*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

SSSR., 1959, 147; *Biol. Abstr.*, 1961, 42573).

S. spirale Roxb.
Roots rich in alkaloidal contents, while bark and woody roots contain glycosidic alks. (*Bull. Calcutta Sch. trop. Med. Hyg.*, 1958, **6**, No. 4, 162).

S. torvum Sw.
The drug used in treatment of coughs and as sedative, diuretic and digestive tonic; active principle either a glycoside or solamine alk. (*W. Afr. Pharm.*, 1959, **1**, 10; *Chem. Abstr.*, 1960, 12493 *h*).

***S. tuberosum** Linn.
English–*White flower potato.*
Fresh white petals contain 0·2% rutin (*J. chem. Soc. Japan*, 1951, **72**, 70; *Chem. Abstr.*, 1952, 4735 *d*).
Widely cultivated.

S. xanthocarpum Schrad. & Wendl.
Contains 1% of alks., can form a source for cortisone and sex hormone preparations (*Indian J. Pharm.*, 1958, 247).

SONNERATIA (*Lythraceae*)

***S. apetala** Buch.-Ham.
The bark and the wood yield 3,3′-4-trimethoxy-4′-hydroxydiphenic acid dilactone, 3,3′-dimethoxy-4,4-dihydroxydiphenic acid dilactone, β-sitosterol and ursolic acid (*J. sci. industr. Res.*, 1962, **21B**, 549).
Common in Sundarbans, Deccan Peninsula as far as the Konkan.

S. caseolaris Engl. syn. *S. acida* Linn. f.
Trunk-bark and the wood yield archin, archinin and archicin (*J. sci. industr. Res.*, 1950, **9B**, 118, 142).

***S. griffithii** Kurz.
Pounded roots rubbed on the skin in treatment for ringworm.
Occurs in the Andaman Islands and Burma.

SOPHORA (*Leguminosae*)

S. tomentosa Linn.
Alks. matrine, methylcytisine, cytisine and an unidentified base (*N.Z. Jl. Sci.*, 1961, **4**, 13; *Chem. Abstr.*, 1961, 19135 *h*).

SORBUS (*Rosaceae*)

S. aucuparia Linn. syn. *Pyrus aucuparia* Gaertn.
Fruits of *S. aucuparia* and *S. dacia* are the richest sources of provitamin A and vitamin C for obtaining vitamin preparations and to add vitamins to food (*Farmacia, Buc.*, 1956, **4**, 230).

SORGHUM (*Gramineae*)

S. vulgare (Linn.) Pers.
Cyanogenetic glucoside localized in aerial shoots; seeds are free (*Plant Physiol.*, 1960, 535; *Biol. Abstr.*, 1961, 2341). Preparation of *d*-xylose from the plant [*Alex. J. agric. Res.*, 1958, **6**(1), 39; *Biol. Abstr.*, 1961, 73541].

SPHAERANTHUS (*Compositae*)

S. indicus Linn.
Flowers swallowed to cure conjunctivitis.
Essen. oil from the whole plant; yield 0·01% (*Perfum. essent. Oil Rec.*, 1959, **50**, 765).

SPHENODESMA (*Verbenaceae*)

***S. pentandra** Jack.
A decoction of roots used for rheumatism.
Found from Assam and the Khasia Mts. to Malacca.

SPINACIA (*Chenopodiaceae*)

S. oleracea Linn.
English–*Spinach.*
Fatty acids of green leaves and occurrence of Δ-trans-hexadecenic acid [*Z. Naturf.*, 1961, **16b**(9), 561; *Biol. Abstr.*, 1962, 20380].

STACHYS (*Labiatae*)

S. sylvatica Linn.
The herb and as also *S. betonica* have a noticeable physiological action on human body but need more detailed study (*Biol. Abstr.*, 1959, 11434).

***S. tuberosa** Lour.
Chinese–*Paipu, bachbo.*
The drug long in use in treatment of scabies, as a vermifuge, as an insecticide, and also as a cough remedy. Recently it is also reported to be valuable in pediculosis.
Roots used in phthisis, for coughs and chest complaints.
Two alks. paipunine and sinostemonine are obtained from *S. tuberosa*. Isolation of protostemonine (*J. pharm. Soc. Japan*, 1947, **67**, 182). Two new alks. isotuberostemonine and hypotuberostemonine from the roots [*A. Rep. ITSUU Lab.*, 1956, No. 7, 24; *Chem. Abstr.*, 1957, 1540 *f*).
Bengal, Sylhet, Assam and North Circars; also in China.

STENOLOBIUM (*Bignoniaceae*)

S. stans (L.) Seem. syn. *Tecoma stans* (Linn.) H.B.K.
From powdered drug are extracted triterpenes, hydrocarbons, resins and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

an acid layer containing the alkaloidal fraction. This fraction yields a liq. alk., tecomine, and another alk., m.p. 275° (*Egypt. Pharm. Bull.*, 1959, **41**, No. 6, 73; *Chem. Abstr.*, 1960, 21646 *c*). Leaves give another alk., tecostanine (*Ann. pharm. franc.*, 1963, **21**, 699; *Chem. Abstr.*, 1964, **60**, 8072 *g*).

STEPHANIA (*Menispermaceae*)

S. glabra (Roxb.) Miers syn. *S. rotunda* Hook. f. & Th.

Identity of alkaloids gindarine and gindarinine with tetrahydropalmatine and palmatine respectively (*J. sci. industr. Res.*, 1952, **11B**, 337). Alk. rotundine, chemistry [*Pharm. Zentralh.*, 1964, **103**(2), 99; *Chem. Abstr.*, 1964, **61**, 4151 *e*].

S. hernandifolia (Willd.) Walp.

Examination of roots, rhizomes and leaves shows the presence of alks., steroids and fats (*Indian J. Pharm.*, 1960, **22**, 63).

Alks., isolated from the roots: fangchinoline, *dl*-tetrandrine, *d*-tetrandrine, and *d*-isochondrodendrine (*J. pharm. Sci.*, 1961, **50**, 819).

STICHONEURON (*Roxburghiaceae*)

***S. caudatum** Ridley

Leaves eaten with betel as a tonic in convalescence; the Malayan name suggests an abortifacient.

Found in North-East India and Malaya Peninsula.

STIPA (*Gramineae*)

S. sibirica Lam.

Fresh grass poisonous to horses, ponies and mules; contains HCN (*Indian For.*, 1963, 423).

STREBLUS (*Moraceae*)

S. asper Lour.

The drug action on myocardium, comparable to adrenaline. A glycoside, stebloside, its isolation and comparison with digitoxin (*Indian J. med. Sci.*, 1964, **18**, 191). Pharmacognosy of root-bark and its tincture (*Indian J. Pharm.*, 1963, **25**, 372).

STROBILANTHES (*Acanthaceae*)

***S. flaccidifolius** Nees

Pounded leaves for poulticing for ague in children; also used for coughs.

Northern and Eastern Bengal and Assam, alt. up to 1500 m. in the lower hills; often cultivated.

***S. lupulinus** Nees

Essen. oil distilled from flower buds, powerful and agreeable odour (*Perfum. essent. Oil Rec.*, 1911, **2**, 96).

Common in the neighbourhood of Bombay; W. Deccan Peninsula.

STRYCHNOS (*Loganiaceae*)

S. nux-vomica Linn.

Purification of seeds by Ayurvedic process (*Indian Pharm.*, 1953, **9**, 67).

Extn. of alks. by turpentine as solvent (*Indian J. Pharm.*, 1953, **15**, 6). Determination of strychnine and brucine by paper chromatography, accuracy ±5 (*J. Pharm., Lond.*, 1961, **13**, 504).

Diagnostic features in distinguishing two adulterants *S. nux-blanda* and *S. potatorum* from *S. nux-vomica* Linn. (*J. Pharm. Pharmacol.*, 1963, **15**, 594).

STYLOPHORUM (*Papaveraceae*)

***S. lactucoides** Benth. & Hook. f. syn. *Dicranostigma lactucoides* Hook. f. & Thom.

Upper earth parts of the plant contain alks.: (+)-isocorydine, protopine, α-allocryptopine, a little chelerythrine, sanguinarine, chelirubine, coptisine, berperine and a new alk.

Roots—the chief alk. is chelerythrine, accompanied by all the rest together with oxysanguinarine and a little of corytuberine (*Colln Czech. chem. Commun., Engl. Edn*, 1961, **36**, 1839; *Chem. Abstr.*, 1961, 27782 *d*).

Inner ranges of the Garhwal Himalayas, alt. 3500 m.

SWERTIA (*Gentianaceae*)

S. chirata Buch.-Ham.

Assay (*Indian J. Pharm.*, 1952, **15**, 87).

SWIETENIA (*Meliaceae*)

***S. macrophylla** King

English–*Mahogany*.

Swietenine, the non-bitter principle of the seeds (*J. Indian chem. Soc.*, 1955, 179; 1957, 117; 1960, 440).

Introduced and now growing in India.

SYMPLOCOS (*Symplocaceae*)

S. racemosa Roxb.

Bark gives a dark-red colouring matter and an amorphous lactone (*Res. J. Hindi Sci. Acad.*, 1958, 211). Investigation on the antimicrobial and pharmacological actions of some fractions from the bark (*Indian J. Pharm.*, 1964, **26**, 129).

SYZYGIUM (*Myrtaceae*)

S. aromaticum (Linn.) Merr. & Perry syn. *Eugenia aromatica* Kuntze

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Clove oil, yield 15·5%, contains eugenol 92%, acetyleugenol, caryophyllene and furfural traces (*Indian Soap J.*, 1952, **18**, 161). Eugenol determination in the oil (*Drug Stand.*, 1954, **22**, 103; *Chem. Abstr.*, 1954, 11006 *b*).

S. cumini (Linn.) Skeels syn. *Eugenia jambolana* Lam.

Drug used in the treatment of diabetes mellitus in the tropics.

Seeds contain glycoside jambolin, ellagic acid, tannin (19%), gallic acid, chlorophyll, fatty oil, starch, resin, sugar, and traces of oil. The bark contains tannins (10-12%), gallic acid, resin, starch and proteins, but no alk. or glucoside (*Acta Phytother.*, 1960, **7**, 23; *Chem. Abstr.*, 1961, 25161 *h*). Effective hypoglycemic principle extracted from dried seeds with 95% alcohol (*J. Pharm., Lond.*, 1961, **13**, 381). Flowers give three triterpenoids (*J. sci. industr. Res.*, 1962, **21B**, 457).

S. jambos (Linn.) Alston

English–*Rose-apple*.

Fruits — free amino acids (*Sci. & Cult.*, 1964, **30**, 505).

TABERNAEMONTANA (*Apocynaceae*)

***T. crispa** Roxb.

Root-bark contains alks. and neutral compds. (*Curr. Sci.*, 1952, **21**, 315).

Andaman Islands.

T. heyneana Wall.; see **Ervatamia heyneana** T. Cooke

TAGETES (*Compositae*)

T. erecta Linn.

Essen. oil (yield 0·06% on dry basis) of a sweet and lasting odour, contains *d*-limonene, ocimene, *l*-linalyl acetate, *l*-linalool, tagetone and nonanal (*Perfum. essent. Oil Rec.*, 1961, **52**, 261; *Soap Perfum. Cosmet.*, 1963, **36**, 686).

TAMARINDUS (*Leguminosae*)

T. indica Linn.

Tamarind kernel polysaccharides (*J. sci. industr. Res.*, 1961, **20D**, 380). Chemistry, biochemistry and technology (*J. sci. industr. Res.*, 1964, **23**, 204). Glycosides of leaves (*Curr. Sci.*, 1964, 581).

TAXUS (*Taxaceae*)

T. baccata Linn.

Alk. taxine, a complex mixture, consists of pure alks. taxine A and taxine B [*Pharm. Zentralh.*, 1957, **96**(8), 385; *Biol. Abstr.*, 1958, 28418]. Taxine B, the main alk. [*Arch. Pharm. Berl.*, 1958, **291**(9), 443; *Biol. Abstr.*, 1959, 23382].

TECOMA (*Bignoniaceae*)

T. stans (Linn.) H.B.K.; see **Stenolobium stans** (L.) Seem.

TEPHROSIA (*Leguminosae*)

T. candida (Roxb.) DC. syn. *Lonchocarpus fruticosus* Span.

Seeds—potent insecticide (*Indian J. Ent.*, 1955, **17**, 165); contain cardiac glucosides, viz. gufruside and frugoside (*Med. Prom. SSSR*, 1957, **11**, No. 1, 38; *Chem. Abstr.*, 1958, 8465 *a*; *Indian J. Pharm.*, 1956, 339).

T. lanceolata R. Grah.; see **T. purpurea** (L.) Pers.

T. maxima Pers.; see **T. purpurea** (Linn.) Pers.

T. purpurea (Linn.) Pers. syn. *T. maxima* Pers. or *T. purpurea* var. *maxima*; *T. lanceolata* R. Grah.

Roots yield 'maxima substance A' 0·8%, 'maxima substance B' 0·1%, and 'maxima substance C' 0·8%, three crystalline compds. (*Curr. Sci.*, 1954, **23**, 397; *Indian J. Pharm.*, 1961, 31). Maxima substance C shows isoflavone structure, chemically related to rotenone (*Arch. Pharm. Berl.*, 1959, **292**(1/8), 170; *Biol. Abstr.*, 1959, 14343).

Pods give 'purpurin A', 'purpurin B' and 'maximin', the last one only toxic to fish (*Curr. Sci.*, 1956, **25**, 396). Synthesis of 'maxima substance B' (*J. sci. industr. Res.*, 1962, **21B**, 97).

Leaves contain 1·4% of rutin (*Indian J. Pharm.*, 1955, 136).

TERMINALIA (*Combretaceae*)

T. arjuna Wight & Arn.

Powdered bark relieves hypertension, has a diuretic and a general tonic effect in case of cirrhosis of the liver (*Indian Heart J.*, 1951, **3**, 205). Bark considered a cardiac stimulant; shows the presence of calcium (*Vikram*, 1967, 111). Isolation of arjunalic acid saponin and (+) leucodelphinidin (*J. sci. industr. Res.*, 1962, **21B**, 89).

T. belerica Roxb.

Heartwood, bark and fruits contain ellagic acid and the seed-coat of the fruit contains gallic acid (*J. sci. industr. Res.*, 1961, **20B**, 554).

***T. manii** King

H.–*Kala chuglam*.

Isolation of melanoxetin from the heartwood (*J. sci. industr. Res.*, 1962, **21B**, 196).

A native of Andamans.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

T. paniculata Roth
Isolation of a new glucoside, *dl*-methyl ellagic acid, from the heartwood (*Tetrahedron*, 1962, 357).

T. tomentosa Wight & Arn.
Bark gives waxy substance, crystalline substance characteristic of terpenoides (*Indian J. Pharm.*, 1959, 285).

TETRAMELES (*Datiscaceae*)

***T. nudiflora** R. Br.
Bo.–*Ugad, Bondsa.*
Bark—laxative and diuretic; its decoction taken for rheumatism, oedema, ascites and icterus.
Western Ghats from Bombay to Ceylon, Burma, Tenasserim and Andamans, Sikkim 600 m.

TETRASTIGMA (*Vitaceae*)

***T. lanceolarium** Planch syn. *Vitis lanceolaria* Wall ex Wight & Arn.; *Cissus lanceolaria* Roxb.
Miri–*Tadi-ripun-riubi.*
Poultices of leaves applied to boils and also to the body for ague.
Found in Nepal and Sikkim Himalaya; Khasia Mts., alt. 1000-3000 m. Common in frontier districts of Assam.

THALICTRUM (*Ranunculaceae*)

T. minus Linn. syn. *T. thunbergi* DC.
Alk. magnoflorine in leaves and stems 0·004%, roots 0·08% (*Chem. pharm. Buil. Tokyo*, 1958, **6**, 107; *Chem. Abstr.*, 1959, 5588 *c*). Alks. thalicberine and O-methylthalicberine (*Yakugakuzasshi*, 1963, **83**, 153; *Chem. Abstr.*, 1963, 3971 *b*).

***T. pedunculatum** Edgew.
Local people use it for ophthalmia. Alk. berberine (*Indian J. Pharm.*, 1964, **26**, 69).
Found in West Himalayas, from Simla to Kaffristan (2500 m.).

THEMEDA (*Gramineae*)

***T. arguens** (L.) Hack.; see **Anthistiria arguens** Willd.

THESPESIA (*Malvaceae*)

T. populnea Soland. ex Correa
Seeds contain fatty oil (20%), estimation of the component acids [*Proc. Indian Acad. Sci.*, 1954, **39**(6), 301].

THEVETIA (*Apocynaceae*)

T. peruviana (Pers.) Schum. syn. *T. neriifolia* Juss. ex Steud.
Review—properties of cardiotonic principle, thevetin (*Fitoterapia*, 1954, **25**, 445; *Chem. Abstr.*, 1955, 4935 *h*; 1957, 3091 *i*). New minor digitalis poisons in the grains of *T. neriifolia*, thevefoline and theveneriine (*C.R. Acad. Sci., Paris*, 1956, **242**, 2395; *Chem. Abstr.*, 1956, 14185 *c*). An heteroside from the seeds (*Bull. Soc. Pharm. Bordeaux*, 1956, **95**, 31; *Chem. Abstr.*, 1957, 6087*g*). Seed-kernels give a fatty oil and a water-soluble glycoside, thevetin. Defatted kernels, on subjection to enzymic action, give four glycosides: cerberine, neriifolin, peruvoside and ruvoside (*J. sci. industr. Res.*, 1958, **17B**, 332).
Detection of yellow oleander by chromatography (*Sci. & Cult.*, 1960, **26**, 232; 1964, **30**, 191).

THUJA (*Coniferae*)

***T. orientalis** Linn.
Roots give essen. oil, 95% yield (*Indian Oil Soap J.*, 1963, **29**, 45).
Commonly cultivated in India.

THUNBERGIA (*Acanthaceae*)

***T. alata** Bojer ex Sims
English–*Black-eyed susan.*
Leaf applied in poultices for headache.
An African herb, widely cultivated in India; naturalized in lower Assam and North-East Bengal.

***T. grandiflora** Roxb.
B.–*Nul-lata.*
A decoction of the leaves drunk for stomach complaints and the leaves used as a poultice.
Found from Bihar and Sikkim to Assam and in Bengal at alt. 1500 m.

***T. laurifolia** Lindl.
The juice of the leaves taken for menorrhagia; put in the ear for deafness; cuts and boils poulticed with leaves by the Malayans.
Malay Peninsula and Andamans.

THYMUS (*Labiatae*)

T. serpyllum Linn.
P.–*Masho, Shakei.*
Essen. oil, containing thymol (35%), phenylurethane, linalool, *p*-cymene, α-pinene and *d*-borneol (traces) (*J. pharm. Soc. Japan*, 1952, **72**, 1684; *Chem. Abstr.*, 1963, 2941 *h*). New use in the cure of radiculite ischias neuralgia (*Biol. Abstr.*, 1959, 11435).

T. vulgaris Linn.
Essen. oil, as anthelmintic, shows low toxicity on ascarides, very toxic to mice (*Acta pharm. jugosl.*, 1953, **5**, 183; *Chem. Abstr.*, 1956, 9693 *h*). Exts. of stems and leaves during flowering

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

possess maximum antibacterial activity against Staphylococcus (*Ziva*, 1958, **6**, 164; *Chem. Abstr.*, 1960, 2657 *f*).

Constituents of Thyme herb; isolation of pure caffeic acid [*Pharm. Zentralh.*, 1959, 98(6), 356; *Biol. Abstr.*, 1960, 57099].

TILIACORA (*Menispermaceae*)

T. acuminata (Lam.) Miers; see **T. racemosa** Colebr.

T. racemosa Colebr. syn. *T. acuminata* (Lam.) Miers

Isolation of tiliacorine and tiliarine, their characterization (*J. sci. industr. Res.*, 1957, **16B**, 156).

TINOSPORA (*Menispermaceae*)

T. cordifolia (Willd.) Miers

Tinosporine, the furanoid bitter principle (*Sci. & Cult.*, 1960, 140).

TORENIA (*Scrophulariaceae*)

***T. polygonoides** Benth.

The whole plant pounded alone or with rice-flour, and smeared as poultice on sores on the legs and ulcers, and on the abdomen for dropsy.

Cachar, Tenasserim and Singapore; Penang and Malacca.

TOXOCARPUS (*Asclepiadaceae*)

***T. villosus** Decne. syn. *Secamone villosa* Blume

The plant used for treating sprue.

Mountains of the South Deccan Peninsula, Ceylon and Java.

TRACHYSPERMUM (*Umbelliferae*)

T. ammi (Linn.) Sprague syn. *Carum copticum* Hiern

Ajowan seeds yield essen. oil, containing 30-35% thymol (*Izv. Akad. Nauk Kazakh. SSR.*, 1959, No. 1, 90; *Chem. Abstr.*, 1961, 5875 *d*). Composition: thymene, α-pinene, *p*-cymene, dipentene and γ-terpinene (*Perfum. essent. Oil Rec.*, 1959, **50**, 204).

T. roxburghianum (DC.) Craib. syn. *Carum roxburghianum* Benth. ex Kurz

Seeds yield essen. oil (1·8-2·0%), fixed oil (4·4-4·5%) and a ketonic crystalline compd. (0·09%) of spasmolytic activity (*Indian J. Pharm.*, 1953, **15**, 298).

TREWIA (*Euphorbiaceae*)

T. nudiflora Linn.

Bark yields a pentacyclic triterpene ketone, tetraxerone, and β-sitosterol (*Indian J. Chem.*, 1964, **2**, 171).

TRIBULUS (*Zygophyllaceae*)

T. terrestris Linn.

Harman occurs in the herb and harmine in the seeds (*Biul. Inst. Rosl. leczn.*, 1960, **6**, 220; *Chem. Abstr.*, 1961, 25159 *e*).

TRICHOSANTHES (*Cucurbitaceae*)

T. cucumerina Linn.

Component fatty acids of seed fat (*J. Indian chem. Soc.*, 1958, 167).

TRIFOLIUM (*Leguminosae*)

***T. alexandrinum** Linn.

English–*Barseem, Egyptian clover.*

l-Ascorbic acid and reducing sugar content during growth and successive cuttings (*Ann. Agric. Sci.*, 1956, **1**(2), 81; *Biol. Abstr.*, 1960, **35**, 5491). Purified apyrase preparation 13·5 times active as the crude preparation (*Indian J. exp. Biol.*, 1964, **2**, 41).

Egypt; Asia Minor. Cultivated in India as fodder plant.

***T. fragiferum** Linn.

English–*Strawberry clover.*

Kashmir–*Chit-batl.*

Saponins from the plant on hydrolysis yield soyasapogenal B, soyasapogenal C and an unidentified sapogenin (*J. Amer. pharm. Ass., Sci. Ed.*, 1960, **49**, 735).

Temperate zone of Kashmir.

T. prātense Linn.

English–*Red clover.*

Occurrence of genistein in *T. pratense*, as well as in *T. subterraneum* Linn., *T. campestre* Shreb. and *T. globasum* Linn. (*Aust. J. exp. Biol. med. Sci.*, 1955, **33**, 243; *Chem. Abstr.*, 1956, 529 *i*). Constituents of the acetone-soluble lipids of the leaves (*Biochem. J.*, 1962, **82**(3), 523).

Pectolinarin and 14 other flavonoids isolated from *T. pratense* as also from *Cirsium oleraceum* (*Arch. Pharm. Berl.*, 1960, 1053; *Biol. Abstr.*, 1961, 78005).

Non-protein nitrogen compds. (amides) in the fodder [*Ann. Univ. M. Curie-Sklodowska*, 1958, **13**(16), 269; **13**(17), 279; *Biol. Abstr.*, 1961, 21680, 21681].

T. repens Linn.

English–*White clover.*

Cyanogenetic glucoside in 60% yield (*N.Z. J. Sci. Tech.*, 1951, **33A**, 56; *Chem. Abstr.*, 1952, 689 *b*).

Oestrogenic substances [*Arch. Zootecnia*, 1957, **6**(22), 160; *Biol. Abstr.*, 1958, 10034].

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TRIGONELLA (*Leguminosae*)

T. corniculata Linn.
Seeds give 4 crystalline compds., triacontane, β-sitosterol and alks. choline and betaine (*Indian J. Pharm.*, 1964, **26**, 81).

T. foenum-graecum Linn.
Seeds contain saponin 1% (*Med. trop.*, 1945, **5**, 324; *Chem. Abstr.*, 1951, 7307 *g*). A lactation promoting factor in the fenugreek oil (*Hoppe-Seyl. Z.*, 1951, **286**, 260; *Chem. Abstr.*, 1954, 2325 *i*). Seeds contain an oil (7%), used as a galactagogue. The defatted meal contains indigestible hydrophilic mucilage (50%) (*Egypt. J. Chem.*, 1959, **2**, 162; *Chem. Abstr.*, 1960, 7065 *d*).

TRIGONOSTEMON (*Euphorbiaceae*)

***T. longifolius** Baill.
Strong-smelling leaf rubbed on bodies as cure for fever by the Andamanese.
Found from the Andaman Islands to Singapore.

TRILLIUM (*Liliaceae*)

***T. govanianum** Wall.
Kash.–*Lalri*; Lahaul–*Malla toomachi*.
Roots give a mixture of glucosides, yielding 2·5% diosgenin on hydrolysis (*Indian J. Pharm.*, 1963, **2**, 101).
Found in North-West Himalayas from Kashmir to Kumaon, from 3000 to 4000 m.

TRIPHASIA (*Rutaceae*)

***T. trifolia** (Burm. f.) P. Wils. syn. *T. trifoliata* DC., *T. aurantiola* Lour.
English–*Lime berry*.
H.–*Chini narangi*.
Leaves applied to the body in Indonesia for diarrhoea, colic and skin diseases; also used in cosmetics.
A gum runs from the stem.
Common in gardens throughout India and in various tropical countries.

TRITICUM (*Gramineae*)

T. aestivum Linn. syn. *T. sativum* Lam.
Sepn. of oligosaccharides from wheat grain by paper chromatography [*Biokhimiya*, 1961, **26**(1), 49; *Biol. Abstr.*, 1962, 3095].

TROPIDIA (*Orchidaceae*)

***T. curculigoides** Lindl.
Decoction of roots drunk for diarrhoea or of the whole plant in association with *Ardisia* for malaria, during the cold stage.
A terrestrial orchid found from the Himalayas to Java.

TUSSILAGO (*Compositae*)

T. farfara Linn.
Rhizomes contain ethereal oil, paraffins, inulin and tannins; ethereal oil is the active principle (*Pharmazie*, 1956, **6**, 173; *Chem. Abstr.*, 1951, 8209 *a*).

TYLOPHORA (*Asclepiadaceae*)

T. indica (Burm. f.) Merrill syn. *T. asthmatica* Wight & Arn.
Tylophorine and tylophorinine, the major and minor alks.—synthesis and structure (*Tetrahedron*, 1961, **14**, 284, 288; *Chem. Abstr.*, 1962, 8762 *g*).

TYPHONIUM (*Araceae*)

T. trilobatum (Linn.) Schott
B.–*Chotkochu*.
Bulbs contain β-sitosterol, two unidentified sterols and a crystalline compd. (*J. sci. industr. Res.*, 1961, **20B**, 136).

UNCARIA (*Rubiaceae*)

***U. sclerophylla** Roxb.
Leaves prescribed for applying as a paste to ulcers in Malaya.
Found from the Andaman Islands to Siam and throughout the Malaya Peninsula.

URARIA (*Leguminosae*)

***U. crinita** Desv.
Roots used medicinally; a decoction to arrest diarrhoea; considered effective in driving out worms and sometimes given to children for flatulence and fever and to women after childbirth.
Crushed leaves used externally for lice and for applying to the body for enlarged liver and spleen. Flowers used in a preparation for pimples appearing after smallpox.
Found throughout the Old World tropics.

U. lagopoides DC.
B.–*Golak chakulia*; H.–*Petwan*.
Decoction of leaves and roots used for dysentery by the Malayans. In India it is alterative, tonic and anticatarrhal but seldom used alone.
In old Sanskrit literature, it is said to produce abortion.
Nepal and Bengal to Ava.

U. picta Desv.
Vern.–*Dabra*; *Deter*.
Fruits applied to sore mouths in children in the Punjab.
Himalayas to Ceylon, ascending to 2000 m. alt.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

URGINEA (*Liliaceae*)

U. indica Kunth
English–*Indian squill.*
Yields two water-insol. glycosides (*J. sci. industr. Res.*, 1950, **9B**, No. 5, 114). Gives a crystalline glycoside not identical with one from European, or S. African squills (*J. sci. industr. Res.*, 1954, **13B**, 150). The glycoside from *U. indica* is identical with 'scillaren A' (*J. sci. industr. Res.*, 1956, **15C**, 80).

URTICA (*Urticaceae*)

U. dioica Linn. and **U. urens** Linn.
Stems, leaves and roots of the nettles (*Urtica* sp.), common burdock (*Arctium lappa* Linn. of compositae family), gentian (*Gentiana lutea* Linn.) and St. John's Worts (*Hypericum perforatum* Linn.) finely powdered and extracted with hot water (75-95°C.) and the ext. made into an ointment with beaf-marrow fat, makes an excellent hair-restorer (*Aust. Patent* 176,950, 1953; *Chem. Abstr.*, 1954, 1637 *b*). Odorous constituents of the nettle (*Perfum. essent. Oil Rec.*, 1955, **46**, 79).

USNEA (*Usneaceae*)

***U. flexilis**
Chemical components of the lichen (*J. sci. industr. Res.*, 1961, **20B**, 611).

***U. florida** Wiggs
Usnic acid, salazinic acid and stictic acid isolated from the lichen (*Indian J. Pharm.*, 1955, 71).

***U. hirta**
Usnic acid and salazinic acid isolated from the lichen (*Indian J. Pharm.*, 1954, 151).

***U. rubicunda** St.
Chemical components of the lichen (*J. sci. industr. Res.*, 1961, **20B**, 555).

***U. venosa** Mot.
Chemical components: usnic, barbatic and salazinic acids and ergosterol (*J. sci. industr. Res.*, 1959, **18B**, 394).

VALERIANA (*Valerianaceae*)

V. officinalis Linn.
Essen. oil from rhizomes and roots (*Pharmazie*, 1956, **11**, 271; *Chem. Abstr.*, 1956, 11617; *Soap Perfum. Cosmet.*, 1956, **29**, 1006).
Fresh roots and rhizome exts. contain a cardiac principle, cardiovalen (*Aptech. Delo*, 1956, No. 3, 43; *Chem. Abstr.*, 1957, 5369 *g*). Non-volatile active principles (*Pharmazie*, 1963, **18**, 816; *Chem. Abstr.*, 1964, **60**, 104756 *b*).

V. wallichii DC.
Used medicinally in villages in Nainital (U.P.); contains tartaric, citric, malic and succinic acids (*Agra Univ. J. Res.*, 1960, 175). Isolation of a very active compd. in the Hoffner test from rhizomes and roots (*Arzneimittel-Forsch.*, 1962, No. 12, 12; *Chem. Abstr.*, 1963, **58**, 3269 *e*). Phytochemical examination of the essen. oil from roots; yield 1·86% (*Perfum. essent. Oil Rec.*, 1963, **54**, 576). From the root and rhizome oil isolated, maaliol (*Indian J. Chem.*, 1964, **2**, 170).

VALLARIS (*Apocynaceae*)

V. solanaceae (Roth) O. Ktze. syn. *V. heynei* Spreng.
Fatty acid components of the seed oil and its toxicity (*J. sci. industr. Res.*, 1960, **19B**, 155). Glycosides from leaves with digitalis-like activity [*J. sci. industr. Res.*, 1961, **20C**(5), 161]. From the alcohol ext. of the leaves is obtained a triterpenic acid and ursolic acid (*Indian J. Chem.*, 1963, **1**, 98).

VATERIA (*Dipterocarpaceae*)

V. indica Linn.
Essen. oil from fruit; 1·06% yield (*Riechstoffe Aromen*, 1962, **12**, 357; *Chem. Abstr.*, 1963, **58**, 4371 *a*).

VEPRIS (*Rutaceae*)

V. bilocularis Engler
Alks., kikusaginine, skimmianine and flindersiamine from the stem-bark (*J. sci. industr. Res.*, 1961, **20B**, 298).

VERBASCUM (*Scrophulariaceae*)

V. thapsiforme Schrad.; see **V. thapsus** Linn.

V. thapsus Linn. syn. *V. thapsiforme* Schrad.
Heteroside from fresh leaves, composition (*Ann. pharm. franc.*, 1956, **14**, 409; *Chem. Abstr.*, 1957, 3090 *f*).

VERBENA (*Verbenaceae*)

V. officinalis Linn.
Leaves contain glucoside verbenalin, adenosine and β-carotene (*Arch. Pharm. Berl.*, 1961, **249**, 220; *Chem. Abstr.*, 1961, 14822 *g*).

VERNONIA (*Compositae*)

***V. arborea** Hook. f. (Fl. Br. Ind.), non Buch.-Ham. syn. *V. javanica* DC.
Ass.–*Mas-hoita*; Naga–*Pachet*; Kach.–*Semkhari-phang*.
Juice of leaves in prescription for worms in children's eyes. Infusion of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

roots given in fever, or a decoction of bark in a mixture. In southern Sumatra, the bark is chewed at the first signs of sprue. It is chewed as a substitute for *pan* by Nagas.

Assam, the Khasia Mts., Sylhet, Cachar, Burma, Tenasserim. On the ghats in the Western Peninsula from Konkan southwards and Ceylon.

V. cinerea Less.

The whole plant gives the chemical constituents: β-amyrin acetate, lupeol acetate, β-amyrin, lupeol, β-sitosterol, stigmasterol, α-spinasterol and KCl (*J. Indian chem. Soc.*, 1962, 749).

V. javanica DC.; see **V. arborea** Buch.-Ham.

VETIVERIA (*Gramineae*)

V. zizanioides (Linn.) Nash

Essen. oil from roots (*Indian Soap J.*, 1954, **19**, 193; 1957, **23**, 43). A sesquiterpene, primary alcohol and azulene identified (*Perfum. essent. Oil Rec.*, 1956, **47**, 88; 1957, **48**, 33). Vetiver oil from plants of the Re-union, Haiti, Brazil and Malaya, grown in Java (1-2%), 3·3%; from Indian roots 0·2-0·3% (*Fr. Parf.*, 1964, **8**, 40; *Chem. Abstr.*, 1964, **61**, 1703 *d*).

VICIA (*Leguminosae*)

V. faba Linn. syn. *Faba vulgaris* Moench

English–*Double bean.*

Fresh bulbs useful in diuresis and hepatic functions; contain glyceric acid (*Med. trop.*, 1951, **11**, 869, 872; *Chem. Abstr.*, 1952, 4179 *e*). Isolation of vicine and its preparations (*Arzneimittel-Forsch.*, 1957, **7**, 755; *Chem. Abstr.*, 1958, 5748 *b*). Digestion studies *in vitro* (*J. sci. industr. Res.*, 1960, **19B**, 14). Isolation of pipecolic acid, yield 0·435% (*J. sci. industr. Res.*, 1961, **20C**, 328).

V. hirsuta Koch

H.–*Gegla, Masur-chana.*

Leaves yield 2·5-3% apiin and quercitrin (*J. pharm. Soc., Japan*, 1955, **75**, 172; *Chem. Abstr.*, 1955, 8656 *d*).

V. sativa Linn.

English–*The Tare.*

H. & B.–*Ankari.*

Isolation of vicine and its preparations (*Arzneimittel-Forsch.*, 1957, **7**, 755; *Chem. Abstr.*, 1958, 5748 *b*).

Ascending from the plains of Bengal to 2500 m. in Kumaon in U.P., probably always cultivated.

VIGNA (*Leguminosae*)

V. cylindrica Skeels syn. *V. catjang* Walp.

English–*Cowpeas.*

Seeds contain stigmasterol and can be used in place of soyabean (*Bull. Calcutta Sch. trop. Med. Hyg.*, 1955, 5(3), 108]. Study of the amino acids of cowpeas (*Qualitas Pl. Mater. veg.*, 1959, **6**, 11).

VILLEBRUNEA (*Urticaceae*)

***V. integrifolia** Gaudich. syn. *V. sylvatica* Blume; see **Oreocnide integrifolia** Miq.

VINCA (*Apocynaceae*)

V. pusilla Murr. syn. *Lochnera pusilla* (Murr.) K. Schum.

Two alks., pusiline and pusilinine, and three sterols isolated; both alks. heart depressants (*Indian J. Pharm.*, 1959, 255).

V. rosea Linn. syn. *Lochnera rosea* (Linn.) Reichb.

Four alks. possessing antibacterial activity from leaves and two glycosidal principles and ursolic acid (*Indian J. med. Res.*, 1958, **46**, 588); leurosine, isoleurosine, perivine, mitraphylline, lochnerine, perosine, sitsirikine, perividine, and canvincine from the leaves (*Lloydia*, 1963, **26**, 243; *Chem. Abstr.*, 1964, **60**, 11047 *a*).

Isolation of ursolic acid from whole plant (*J. Indian chem. Soc.*, 1957, 340); isolation and characterization of the chemical constituents of the plant (*Indian J. med. Res.*, 1958, **46**, 588); six minor alks., isoleurosine, lochneridine, sitsirikine, vincamicine, catharine and vindolicine, isolated from the plant (*J. pharm. Sci.*, 1961, **50**, 409; *Chem. Abstr.*, 1962, 541 *i*); vindorosine and lichnerinine from total plant (*Colln Czech. chem. Commun., Engl. Edn*, 1963, **28**, 1419; *Chem. Abstr.*, 1963, 7583 *a*); total of 44 alks. from the plant (*Lloydia*, 1963, **26**, 243, *Chem. Abstr.*, 1964, **60**, 11047 *a*).

Isolation of vinceine possessing hypotensive activity from root (*C. R. Acad. Sci., Paris*, 1953, **236**, 1993); biological investigations of the alks. of the plant including roots (*Indian J. Pharm.*, 1956, **18**, 73); isolation of δ-yohimbine (ajmalicine) from the roots (*Proc. pharm. Soc. Egypt., Sci. Ed.*, 1957, **39**, 201; *Chem. Abstr.*, 1958, 20898 *c*); total alks. and reserpine contents of the root samples from Travancore, raised

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

in Jammu (*J. sci. industr. Res.*, 1959, **18B**, 175); four alks. from roots, vinosidine, lochnerivine, leurosivine, cavincine (*J. pharm. Sci.*, 1963, **52**, 713; *Chem. Abstr.*, 1963, **50**, 9084 *d*); twenty-four alks. isolated so far from roots (*Lloydia*, 1963, **26**, 141; *Chem. Abstr.*, 1964, **60**, 5887 *b*).

Root-bark yields serpentine, ajmalicine, etc., and two neutral products, as also D-camphor 0·03% [*Bull. cent. Res. Inst. Univ. Kerala*, 1957, **5A**(1), 65]; lochnericine, a new alk. in 0·008% yield from the dried root-bark (*Tetrahedron*, 1959, **6**, 89; *Chem. Abstr.*, 1959, 15471 *i*); alstonine and serpentine isolated from the root-bark (*J. sci. industr. Res.*, 1961, **20B**, 428).

Three crystalline alks., ajmalicine, serpentine and lochnerine (*Chem. & Ind.*, 1956, 173); vindolinine, the 11th alk. (*Bull. Soc. chim. Fr.*, 1959, **1959**(6); 891; *Biol. Abstr.*, 1959, 14339); some alks. as in *Rauvolfia serpentina*; their hypotensive and hypoglycemic actions [*Bull. cent. Res. Inst. Univ. Kerala*, 1959, **6A**(1), 51]; ajmalicine, serpentine and tetrahydroalstonine identified by paper chromatography (*Nagoya Shirtsu Daigaku Yakugakubu Kiyo*, 1960, **8**, 34; *Chem. Abstr.*, 1961, 10802 *f*); catharanthine, another principal alk. (*Ann. chim. Roma*, 1963, **53**, 43; *Chem. Abstr.*, 1963, **58**, 14009 *g*); twenty-eight alks. so far isolated (*Lloydia*, 1962, **25**, 334); constituents (*Nagoya Shirtsu Daigaku Yakugakubu Kiyo*, 1962, **10**, 62; *Chem. Abstr.*, 1964, **60**, 11186 *g*); alk. sitsirikine (*Tetrahedron Lett.*, 1963, 1815, *Chem. Abstr.*, 1964, **60**, 5575 *c*); anticancer alks. (*Proc. int. Pharmacol.*, Second Meeting, Prague, 1963, (7), 63; *Chem. Abstr.*, 1964, **61**, 15927 *h*); vinca alks. (*J. pharm. Sci.*, 1963, **52**, 688; *Analyt. Abstr.*, 1964, **11**, 3917).

Preliminary chemical and pharmacological study and comparison with *R. serpentina* (*Proc. pharm. Soc. Egypt. Sci. Ed.*, 1955, **37**, 139; *Chem. Abstr.*, 1957, 8368); pharmacological action of bark; its alk. resembling serpentine (*Indian J. med. Res.*, 1957, **45**, 567); preliminary pharmacological investigations of lochnera alks. endowed with sustained hypotensive action further enhanced in experimental hypertension (*Indian J. med. Res.*, 1959, **47**, 39); pharmacological actions of the weakly basic fractions (*Curr. Sci.*, 1960, **29**, 391); the major antileukemic ingredient, vincaleukoblastine, approved by the Council of Drugs of the American Medical Association under the generic name of vinblastine [*Q. Jl. crude Drug Res.*, 1965, **5**(2), 701].

VISCUM (*Loranthaceae*)

V. album Linn.

Histamine action of the infusion decreases blood pressure in cats; asthmatic attacks and spasms in guinea-pigs and wheals in test persons. Presence of histamine (*Pharmazie*, 1957, **12**(2), 84; *Biol. Abstr.*, 1957, 32698). Histamine takes part in the therapeutic hypotensive effect of the drug [*Scr. med. Brno*, 1955, **28**(7/8), 257; *Biol. Abstr.*, 1958, 24716].

Viscotoxin, the toxic peptide of *V. album* (*Arch. Pharm. Berl.*, 1956, 289, 358; 1960, 820; *Biol. Abstr.*, 1961, 78006). A review of its use in medicine (*Pharmazie*, 1959, **14**(2), 104; *Biol. Abstr.*, 1959, 46839].

VITEX (*Verbenaceae*)

V. agnus-castus Linn.

Isolation of homo-orientin (*Arch. Pharm. Berl.*, 1963, 296, 598; *Chem. Abstr.*, 1964, **60**, 365 *g*).

Throughout subtropical and tropical India.

V. peduncularis Wall.

Isolation of vitexin and its constitution from bark and leaves (*J. sci. industr. Res.*, 1962, **21B**, 313).

VITIS (*Vitaceae*)

***V. discolor** Dalz.; see **Cissus discolor** Blume

***V. hastata** Miq.

Pounded leaves used to poultice boils and boiled leaves put on the abdomen for ague.

India; Java.

***V. lanceolaria** Wall. syn. *Cissus lanceolaria* Roxb.; see **Tetrastigma lanceolarium** Planch.

***V. polystachya** Wall. syn. *V. polythrsa* King.

Poultices made by boiling the roots used for rheumatism and lumbago.

Tenasserim and Andaman Islands.

WAGATEA (*Leguminosae*)

W. spicata Dalz.

Chemical and pharmacological investigations of vakerin (2% in roots) non-toxic to white mice (*Curr. Sci.*, 1957, **26**, 147; *Chem. Abstr.*, 1957, 17095 *f*).

WALTHERIA (*Sterculiaceae*)

W. indica Linn. syn. *W. americana* Linn.

The plant is regarded as a febrifuge and antisyphilitic in the Philippine Islands. In South Africa, women take a decoction of the root for barrenness.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

WEDELIA (*Compositae*)

***W. biflora** DC.

B.–*Sonki*.

Pounded leaves are used as a poultice for discoloured skin, cuts, insect-bites, ulcers, sores, swellings and varicose veins. Also applied to the abdomen of women after childbirth and for undefined pains. Juice of the leaves is given as a tonic in cow's milk after childbirth; also in a mixture with rhubarb for chronic constipation. Boiled leaves given for haematuria, diuretic action.

Flowers violently purgative. Goats, if they browse on old leaves and stems, are poisoned, vomit and die.

Roots recommended for vaginal discharges, gonorrhoea and gravel. Also applied on wounds and for itch.

Plant used in Lower Siam for headache and fever.

Found near the sea from Bengal and Bombay to Ceylon and Singapore.

W. calendulacea Less.

Expressed juice of herb contains oil-soluble black dye, 11·2; waxy compd. 29·7; phytosterol, 3·75; carotene, 1·14; chlorophyll, 3·75, resin, 44·95; $CHCl_3$ ext. (resinous mass), 27; germ, 80; total sugar, 1040; tannin, 220 and saponin, 500 mg. besides inorganic salts, siliceous materials, pectin, mucin, lignin and cellulosic substances (*Indian Pharm.*, 1951, **7**, 12).

WITHANIA (*Solanaceae*)

W. coagulans Dunal

Chemical examination of fruit (*Indian J. Pharm.*, 1963, **25**, 163). Seed oil screened for linoleic acid-rich oil for therapeutic value in preventing atherosclerosis (*Indian J. Pharm.*, 1964, **26**, 80).

W. somnifera Dunal (including *W. ashwagandha* Kaul)

Alks. extn; 45% alc. gives highest percentage (*Indian Pharm.*, 1952, **8**, 57). Isolation of nicotine, somniferine, somniferinine, withanine, withananine and pseudowithanine (*Indian J. Pharm.*, 1955, **17**, 158). Identn. by circular chromatography of alks. (*J. Chromat.*, 1960, **3**, 591; *Chem. Abstr.*, 1961, 4883 *g*). Estimation of total alks. by a process giving consistent results (*Indian J. Pharm.*, 1960, 943). Isolation of sucrose, β-sitosterol, and acid and a neutral compd. from the roots (*J. sci. industr. Res.*, 1962, **21B**, 506). Occurrence of isopelletierine in the roots (*J. pharm. Sci.*, 1962, **51**, 1194). Roots contain tropine, pseudotropine, 3α-tigloyloxytropane, choline, cuscohygrine, *dl*-isopelletierine, and new alks., anaferine and anhygrine (*Lloydia*, 1963, **26**, 258).

Leaves and roots have antibiotic activity against *Staph. aureus* (*Curr. Sci.*, 1956, **25**, 57). Leaves contain withanone having empirical formula $C_{34}H_{32}O_6$ (*J. pharm. Sci.*, 1961, **50**, 876; *Chem. Abstr.*, 1962, 3565 *e*).

Amino acids from the berries (*Curr. Sci.*, 1960, **29**, 22).

Total alks. (in *W. ashwagandha*) 0·20% (*Indian J. Pharm.*, 1960, 250). Chemical and pharmacognostic studies for differentiating the roots of *W. ashwagandha* and *W. somnifera* (*Indian J. Pharm.*, 1961, 126). Pharmacological investigations (*Indian J. Physiol. Pharmac.*, 1960, **35**, 49).

XIMENIA (*Olacaceae*)

X. americana Linn.

English–*Tallow-wood*.

Roots, pounded in water given for colic pain. The oil in oilseeds (65% yield) is non-drying; used for cooking purposes in South India.

Parasitic on the roots of other trees.

YUCCA (*Liliaceae*)

Y. aloifolia Linn.

Sapogenin contents of leaves: smilogenin, tigogenin, gitogenin and chlorogenin (73% of the mixture) (*Arch. Pharm. Berl.*, 1963, 296, 353; *Chem. Abstr.*, 1964, **60**, 3947 *c*).

Y. gloriosa Linn. syn. *Y. recurvifolia* Salisb.

Sepn. of gitogenin (*Japan Patent* 331, 1955; *Chem. Abstr.*, 1956, 11622 *i*).

***Y. recurvifolia** Salisb.; see **Y. gloriosa** Linn.

ZANTHOXYLUM (*Rutaceae*)

Z. acanthopodium DC.

Essen. oil from seeds contains dipentene and phellandrene 47·0%, linalool 37·5%; citral 6·0%, methyl cinnamate 6·2% and traces of free acids (*Indian Perfumer*, 1957, **1**, 50).

Z. alatum Roxb.

Essen. oil from leaves—the carbonyl compd. identified as Me. *n*-nonyl ketone. The ketone-free fraction contained linalyl acetate, sesquiterpene hydrocarbon and tricosane (*Perfum. essent. Oil Rec.*, 1960, **51**, 246). Dictamnine, isolation from the stem-bark (*J. Indian chem. Soc.*, 1962, 493).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Z. budrunga DC. syn. *Z. rhetsa* (Roxb.) DC.; *Fagara budrunga* Roxb.

Essen. oil (Mullilam oil) from Calcutta samples (*Perfum. essent. Oil Rec.*, 1950, **41**, 441). Essen. oil from the kernels of ripe fruits from western coasts contain δ-terpinene, *d*-α-phellandrene, 4-carene, β-pinene, *d*-α-dihydrocarveol, 4-terpineol and *dl*-carvotanacetone (*Indian Perfumer*, 1959, **3**, pt 2, 99).

Fruit rind contains an antibacterial agent (*Indian J. Pharm.*, 1953, **15**, 312).

Stem-bark showed the presence of lupeol (*Indian J. Pharm.*, 1960, 203).

Z. hamiltonianum Wall. ex Hook. f. syn. *Fagara hamiltoniana* Wall. ex Hook. f. Engl.

Chemical examination of bark (*Indian J. Chem.*, 1963, **1**, 99).

ZATARIA (*Labiatae*)

Z. multiflora Boiss.

Essen. oil from leaves contains phenolic part 69%, *p*-cymene 17%, zatarinol 2%, borneol 3% and liquid acid 0·6% (*Perfum. essent. Oil Rec.*, 1954, **45**, 287).

ZEA (*Gramineae*)

Z. mays Linn.

Stigmata yield a fat containing sitosterol and a small amount of betaine (*Arzneimittel-Forsch.*, 1952, **2**, 20; *Chem. Abstr.*, 1952, 9802 *b*). Certain carotenoides of the yellow corn [*Diss. Abstr.*, 1961, **22**(3), 728]. Corn oil (maize oil) employed in heart disease. Ingestion of the oil (2 oz. per day) and a diet low in animal fat lower serum cholesterol as long-term measure (*Brit. med. J.*, 1963, 1866; *Indian J. Pharm.*, 1964, **26**, 250).

ZINGIBER (*Zingiberaceae*)

Z. officinale Rosc.

The plant is used with pepper as an abortifacient (BURKILL, 2302).

Synthesis of zingiberene (*J. sci. industr. Res.*, 1962, **21B**, 285). Detection of new trace components of the oil [*Canad. J. Chem.*, 1964, **42**(11), 2610; *Chem. Abstr.*, 1964, **61**, 14463 *a*].

Z. zerumbet Rosc. ex Sm.

Essen. oil—isolation of zerumbone from rhizome and preparation of tetrahydrozerumbol and tetrahydrozerumbone (*Perfum. essent. Oil Rec.*, 1960, **51**, 65). Zerumbone, a monocyclic sesquiterpene ketone, inhibits *in vitro* growth of *Micrococcus pyogenes* var. *aureus* and *Mycobacterium tuberculosis* H37 Rv. (*Indian J. Pharm.*, 1962, 83).

ZYGOPHYLLUM (*Zygophyllaceae*)

Z. coccineum Linn.

Fruits—aq. ext. contains a saponin and a tannin. The alcohol ext. yields zygophyllin (*Egypt. Pharm. Bull.*, 1958, **40**, No. 6, 97; *Chem. Abstr.*, 1960, 18888 *f*). Leaves, stems and fruits all contain zygophyllin and quinovic acid but in different proportions (*J. pharm. sci. U.A.R.*, 1960, **1**, 1; *Chem. Abstr.*, 1962, 8841 *g*).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

INDEX OF REGIONAL, TRADE & LANGUAGE NAMES

A

Abiranji (Tam.) 50
Achu mooda (Kan.) 79
Adavibadamu (Tel.) 37
Akas nim (H.) 70
Akupatricum (Tel.) 73
Alangi (Kan.) 76
Aloe (Bo.) 3
Ambuli (M.) 55
Amol (Assam) 41
Amritdaru (S.) 33
Amrul (Kumaon) 76
Anamsule (Kan.) 50
Andachampa (H.) 62
Ankari (H. & B.) 100
Aranthal (Tam.) 76
Arippu (Mal.) 52
Arlantha (Mal.) 76
Awasthi (H.) 77

B

Baballjak (M.P.) 65
Bachbo (Chinese) 93
Bagul (Nepal) 40
Bahuni lahara (Nepal) ... 65
Bajra-danti (Kumaon & Garo) ... 83
Bakalbih (Assam) 56
Bakalpatta (Kumaon) ... 50
Bakeni (Oriya) 70
Bakula (Kan.) 64
Banda (Kumaon) 35
Ban-dheras (B.) 38
Bangikath (Nepal) 41
Banrhea (Assam) 76
Baoli-lata (B.) 90
Basula (M.P.) 56
Batra (H.) 87
Beli (H.) 38
Belsian (Chota Nagpur) ... 38
Besharmi booti (U.P.) ... 47
Bet-rang (B.) 79
Berambang butan (Malay) 76
Beratu (Kan.) 70
Berawchal (Lushai) ... 58
Bhat (H.) 32
Bhatia-rang (B.) 79
Bhatwar (H.) 32
Bhedeli lot (Assam) 75
Bhenta (Oriya) 38
Bhetmas (H.) 32
Bhilmora (Kumaon) 89
Bhuin khajur (Bihar) ... 44
Bhurangi (H. & B.) 18
Bidsale (Kan.) 35
Bilati-sij (B.) 78
Bilihuvinalakki (Kan.) ... 34
Bilinisangi (Kan.) 72
Bilouni (Nepal) ... 62
Bish (H.) 66
Binga (Trade) ... 70
Bobarsa (Bo.) 61
Bogi (Kan.) 43
Bokrillahara (Nepal) ... 75
Bol-jakhandok (Garo) ... 62
Bollanchi (Garo) 50
Bolong (Garo) 41
Bondsa (Bo.) 96
Bora-asing (Assam) 28
Bor-samphol (Garo) 70
Brahmokha (B.) 36
Bridhmitra (S.) 33
Buinowla (H.) 50
Burna (B.) 61
Burupudina (Santal) ... 69

C

Cassava (Indian Bazaar) ... 64
Catukattutivva (Tel.) ... 69
Cedaneredu (Tel.) 56
Chadurang (M.) 52
Chalmori (Kumaon) 76
Chamhun (P.) 41
Chandaust (Delhi) 66
Chandmara (Kan.) 37
Chang-Shah (China) 42
Charai-atha (Assam) ... 72
Chariant (Kashmir) 87
Cheruvayera (Mal.) 68
Chetia-bola (Assam) 41
Chilkadudu (Tel.) 69,89
Chini narangi (H.) 98
Chinna kadambu (Tam.) ... 70
Chirchita (Mar.) 73
Chiti (B. & H.) 65
Chit-batt (Kashmir) 97
Chittila madakku (Mal.) ... 35
Chobeliyat (H.) 33
Chomuntri (Tam.) 37
Chooglum (Andamans) ... 41
Chotkochu (B.) 98
Chuba-atha (Assam) 72
Chariana (Oriya) 64
Chutiachandbol (Santal) ... 46
Cork-gach (B.) 70
Curalvallipanna (Mal.) ... 61

D

Dabra (H.) 98
Daincha (H.) 92
Dangyimrik (Lepcha) ... 71

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Daru jamjuri (Mundari) ... 69
Daru-kaini-ba (Mundari) ... 56
Datwan (G.) 50
Deola (P.) 38
Deter (H.) 98
Dhabni (Bihar) 49
Dienga-ja-sim (Khasi) ... 62
Dieng-brau-salu (Khasi) ... 55
Dieng-lang-leng (Khasi) ... 76
Dieng-si-ing (Khasi) 57
Dieng-soh-eit-iar (Khasi) ... 62
Dieng-sohlynthein (Khasi) ... 70
Dieng-soh-orthai (Khasi) ... 55
Dieng-soh-pit (Khasi) ... 90
Dieng-son-lang-snam (Khasi) ... 50
Dinda kinda (Bihar) ... 44
Dipdavel (G.) 47
Dodak (P.) 19
Domdomah (Andamans) ... 34
Dom-sal (H.) 70
Donglukung (Lepcha) ... 41
Doundi (Mar.) 76
Duduga (Tel.) 70
Dula (P.) 38

E

Eda pandu (Tel.) 17
Elummichchai (Tam.) ... 17
Ependung (Mundari) ... 75

G

Gadagvel (M.) 56
Galuga (Tel.) 70
Gam-salu (Garo) 16
Gandani (Dehra Dun) ... 21
Ganda pulas (Oriya) 70
Gandele (Kan.) 43
Gandh bel (H.) 22
Gandha-raj (B.) 17
Gandhpryanyo (B.) 3
Garandi ara (Mundari) ... 56
Gara sirgiti (Mundari) ... 58
Garjkalai (B.) 32
Gawhla (M.) 3
Gegla (H.) 100
Geowain (Kumaon) 27
Gha (Oriya) 65
Ghaneri (M.) 52
Ghanwla (G.) 3
Gidar rukh (H.) 70
Glagah asu (Java) 79
Golak chakulia (B.) 98
Golum (Bo.) 61
Gondserai (Ass.) 16
Gonorai (Manip. & Sylhet) ... 16
Gonosorai (Ass.) 16
Gophal (Kumaon) 40
Gophla (Kumaon) 40
Goria loti (Assam) 69
Gulikadam (B.) 70
Gulphane (H.) 3
Gurhal (P.) 39
Gurhul (Bihar & Orissa) ... 39
Guttiganneru (Tel.) 50

H

Had-pat (Bihar) 49
Haiza (H.) 50
Hathipich (P.) 36
Hathokane (Nepal) 50
Hatichuk (H.) 36
Hendegel ba (Mundari) ... 56
Hesika (Kan.) 52
Hessare (Kan.) 70, 89
Himapushpa (Oriya) ... 34
Him-champa (H.) 62
Hiremara (Kan.) 43
Hol (Ladakh) 66
Hoom (M. & G.) 69
Hukakanda (Chota Nagpur) ... 34
Humb (M.) 89
Humba (B. & G.) 69
Huring rangaini (Mundari) ... 58

I

Idlemon (M.) 17
Idnimbu (H.) 17
Ilaimergay (Tam.) 43
Ittauduga (Tel.) 3

J

Jaglo (Assam) 61
Jagura (B.) 61
Jaltunga (Kumaon) 87
Jambira (S. & Tel.) 17
Jangali akh (P.) 47
Jhingan (Andamans) ... 76
Jiti (B. & H.) 65
Jivdas (S.) 33
Jungi (H.) 70
Jungli bhindi (B.) 38
Jungli selai (H.) 55

K

Kadassa (H.) 70
Kadavai (Tam.) 34
Kadivi (Tel.) 59
Kadubénde pollika (Kan.) ... 34
Kadwa-sirid (M.) 43
Kaim (H.) 70
Kakke (Kan.) 52
Kala chuglam (H.) 95
Kalakarpur (B.) 55
Kalamandin (Tel.) 17
Kalamb (M.) 70
Kali pahenle (Nepal) ... 57
Kalmi (H.) 70
Kamtiongrik (Lepcha) ... 65
Kanakaitha (Mal.) 70
Kangrem (Lushai) 60
Kaniti (Tel.) 55
Kannadi-yilai (Tam.) ... 37
Kantala (S.) 3
Kanvel (Mar.) 73
Kaoso (Nepal) 71
Kaoul-Kung (Lepcha) ... 41
Kapasiva (P.) 38

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Kappa (Mal.) 64
Kappativva (Tel.) ... 69, 70
Kapur tulsi (H.) 73
Kara (Merwara) 38
Karamanikkay (Tam.) ... 34
Karesuli (Kan.) 50
Kari (H.) 69
Karukaya (Tel.) 17
Karmbi arak (Santal) ... 69
Karna khatta (H. & P.) ... 17
Karpur (B.) 55
Karpur tulsi (B.) 74
Karrapendalmu (Tel.) ... 64
Karudushtu-patige(Tel.) ... 65
Karwai (M.) 43
Karvat (Bo.) 69
Kasi (B.) 71
Katakkantal (Mal.) ... 17, 59
Katesam (Mal.) 70
Kath (Nepal) 57
Kattunarakam (Mal.) ... 38
Kattuvendsi (Tam.) 38
Kaubutkila (Bihar) 34
Kavala-nimb (M.) 70
Kavathum pillu (Tam.) ... 22
Kavuki (Tel.) 70
Keiri (Merwara) 38
Kekke (Kan.) 52
Kelipar (G.) 21
Kesara-dam (B.) 49
Kesariba (Bihar) 49
Khatta (H.) 17
Khichar (Ladakh) 60
Khirakuli (Oriya) 64
Khirkhejur (B.) 64
Khirni (G. & H.) 64
Khitsar (Ladakh) 60
Kilaneli (Mal.) 50
Kirna (H.) 89
Kirua (H.) 69
Kita bo (Bihar) 44
Kodauduge (Tel.) 3
Kodipullu (Mal.) 22
Kokkidi (Visakhapatnam) ... 62
Kolavarvalli (Tam.) 69
Kolavara valli (M.) 69
Kolia (Assam) 69
Kolland (M.) 37
Konda (Tel.) 68
Kouri changai (Tel.) ... 17
Kripa (B.) 59
Kuddam (M.) 70
Kuffyet-kee (Lepcha) ... 76
Kula marsal (Mundari) ... 72
Kunde (Kan.) 56
Kurma (Bo.) 61
Kushu (Ladakh) 63
Kuttra (H.) 55

L

Lajachio (Naga) 62
Lalri (Kashmir) 98
Lasobaval (G.) 55
Lasunghas (H.) 66
Leihruisen (Lushai) ... 58
Lohkasht (S.) 33
Loh-lakkar (Bo.) 33
Lopong-brik (Mikir) 56
Losod ba (Mundari) 55
Loyongtonta ara (Bihar) ... 43
Lukoi (Assam) 76
Lungkhup (Lushai) ... 70
Lusan (P.) 66

M

Mach-mach (Oriya) 70
Machipatri (Tam.) 8
Madanmohan (H.) 18
Maina (B., P. & Delhi) ... 66
Majankeri (Assam) 57
Makari (Nepal) 57
Malla toomachi (Lahaul) ... 98
Mamui (Assam) 50
Manganari (Mal.) 55
Manjipala (Tel.) 64
Manuvu (Tam.) 34
Marachini kizhangu (Mal.) ... 64
Maragenasu (Kan.) 64
Mara-malli (Tam.) 70
Marang-itika (Mundari) ... 71
Maravalli-kizangu (Tam.) ... 64
Maringi (Bo.) 38
Marua-bel (Dehra Dun) ... 65
Masho (P.) 96
Mas-koita (Assam) 99
Massimara (Kan.) 73
Masur-chana (H.) 100
Matham arak (Bihar) ... 43
Mawtda (Andaman) 37
Mekuri-ghila (Assam) ... 71
Metunga (H.) 66
Mi-rang-k'sa (Khasi) ... 40
Mithiari (Jaunsar) 35
Mittha (H.) 17
Mokandar (M.P.) ... 49
Mokari (P.) 17
Molaga shembaga-palei (Tam.) ... 73
Moongra (H.) 85
Moralia (Assam) 61
Mota-pasuti (Assam) ... 50
Mudiyakunthal (Tam.) ... 69
Muka-asing (Assam) 28
Mukuram (Mal.) 37
Mulagiri (Nepal) 16
Muli (H.) 66
Musurdanta (Oriya) 56
Mutwinda (Andamans) ... 41

N

Naga-aieri (Oriya) 56
Nag-phani (M.P.) ... 78
Nagappu (Tam.) 64
Nagari-kesari (Guntur) ... 55
Nagdona (H.) 8
Nagesar (B.) 64
Nagkesar (H.) 64
Nakam (Mal.) 37
Nallapali (Tel.) 50
Nangal-bhanga (Assam) ... 18

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Naspati (H.) 85
Nata hugida (Kan.) 52
Nattuccavundal (Tam.) ... 55
Nayibullal (Kan.) 38
Nayvila (Tam.) 38
Neelipuddae gida (Kan ... 74
Neem-chameli (H.) 70
Nei-kottei (Tam.) 35
Nelabenda (Tel.) 38
Nimi-chambeli (M.) 70
Nimma (Tel.) 17
Nirkadambe (Tel.) 70
Nirneli (Mal.) 50
Nirpanai (Tam.) 46
Nirppul (Tam.) 50
Nul-lata (B.) 96
Numro-kung (Lepcha) ... 61

O

Ome (Bihar) 70
Orange Hazara (H.) 17
Orange quat (H.) 17
Ote budu ba (Mundari) ... 69

P

Pachet (Naga) 99
Paipu (Chinese) 93
Paiyani (Mal.) 76
Pajaneli (Mal.) 76
Palla (Tam. & Mal.) ... 64
Paninoi (Oriya) 69
Panjuli (H.) 50
Panjull (B.) 50
Pannir (Tam.) 34
Panniru chettu (Tel.) ... 34
Pan-turasi (B.) 75
Para (Tam.) 21
Paral (Konkan) 21
Parawal (Konkan) 21
Parupubenda (Tel.) 38
Parvel (H.) 21
Patkuari (Kumaon) 50
Patmossu (Oriya) ... 70, 89
Patnijokra (Assam) 32
Pavana (M.) 50
Pedda-chilka (Tel.) 70
Periuvay (Tam.) 70
Petwan (H.) 98
Phutika (Oriya) 35
Pichae-lakri (Sylhet) ... 56
Pichas-bon (Sylhet) 56
Pirilajuni ba (Mundari) ... 69
Pisara (Bo.) 61
Pishia (Bo.) 61
Pitella (Oriya) 34
Pitus (Kashmir) 79
Plumpung (Java) ... 79
Porprang (P.) 19
Prasarini (S. & Mal.) ... 69
Priyangu (H. & G.) ... 3
Pualeng (Lushai) 62
Pulikampa (Tel.) 52
Pulisar (Tel.) 50
Punnag (M.) 64
Purmo-kung (Lepcha) ... 62

R

Raimuniya (M.P.) 52
Raini (M.) 64
Rajokasundiri (Oriya) ... 55
Ramguwa (Nepal) 41, 50
Ramkurti (H.) 32
Ran bhendi (H.) 38
Ranjana (M.) 64
Ran-limbu (Bo.) 38
Ranpo-pati (Bo.) 74
Ratinagkesar (G.) 64
Ravapu (Mal.) 34
Rayan (G.) 64
Redli (Oriya) 70
Risa (Assam) 76
Rohisa (S.) 22
Rudanti (S.) 13
Runchepot (Nepal) 41
Rungru (H.) 50
Ruteng (Ass.) 56
Ryambai-kutung (Khasi) ... 32

S

Sabu (Kan.) 63
Safedmusli (H.) 88
Safed towdri (H.) 54
Salabmisri (H.) 88, 90
Sam-gichhok(Garo) 56
Samprani (H.) 34
Sam-tham-lang (Garo) ... 56
Sankalu (H. & B.) 76
Sapussumbu (B.) 69
Sarbati lebu (B.) 17
Satapala (Tel.) 56
Savukkumarem (Tam.) ... 33
Savulikodi (Tam.) 69
Seb (H. & B.) 63
Seketia (Assam) 62
Semkhari-phang (Kach) ... 99
Seo (P.) 63
Seraya (Mal.) 64
Sernam (Lushai) 57
Sev (H. & B.) 63
Sevu (Kan.) 63
Shakei (P.) 96
Shimanili (Tel.) 46
Shurinjan shirin (H.) ... 19
Sicka (H.) 41
Silang (U.P. Hills) 76
Siltimur (Nepal) 57
Siltui (Lushai) 41
Simal alu (Assam) 64
Simeyaranelli (Kan.) ... 63
Sitahara (Oriya) 70
Sita savaram (Tel.) ... 68
Sithribodu (Garo) 69
Skimaiyaviri (Tam.) 46
Soh-lygn-kait (Khasi) ... 40
Sonarupa (Assam) 72
Sonki (Bo.) 102
Sukat sing (Kumaon) ... 90

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Sukuri-pota (Mundari) ... 58
Suliuli-kuda (Oriya) 56
Sunamarai (Nepal) 65
Sundrichand (M.) 37
Sungree-kung (Lepcha) ... 41
Suragi (Kan.) 64
Suraponna (Tel.) 64
Susi-porma (Assam) 62
Sutorono (Oriya) 34
Swet juba (B.) 39

T

Tadi-ripun-riubi (Miri) ... 96
Tagarai (Tam.) 55
Takaranniram (Mal.) ... 55
Tala-neli (Tam.) 68
Talanili (Mal.) 69
Tanakku (Tam.) 34
Tanghaercherkung (Lepcha) ... 57
Tarai (Assam) 66
Tatara (H.) 50
Tellarantu (Tel.) 49
Teppam (Tam.) 34
Terhilsok (Lepcha) 57
Tezranga (Assam) 50
Thandara (Tel.) 59
Thaontay (Nilgiris) 87
Thebeloa (Garo) 62
Thianglung (Lushai) 70
Thirippan pullu (Tam.) ... 69
Timi (Assam) 70
Tipparathai (Tam.) 59
Toira Kadam (Lakhimpur) ... 55
Tondsha (M.) 38
Tonga agia (Bihar) 43
Tongus (H.) 65
Tor-elaga (Tel.) 38
Towdri (H.) 54
Tunda (Oriya) 59
Tung (Kashmir & P.) ... 87
Tungrung (N. Bengal & Lepcha) 76

U

Ugad (Bo.) 96
Unnichadi (Tam.) 52

V

Vallari (Tel.) 63
Vayana (Mal.) 73
Velimungil (Tam.) 49
Vellakurunji (Mal.) 49
Venkurini (Mal.) 49
Verundale (Tel.) 69
Vilati nil (H.) 46
Vilayti-sher (Bo.) 78
Viluni (Mal.) 70
Voktescntil (Lushai) 69

W

Waghchoora (Bo.) 34
Wati (Assam) 66
Wilavtigawuth (H.) 66
Womb (Kan.) 70
Wundi (Kan.) 64

Y

Yella mala kai (Tam.) ... 43

Z

Zaitun (H., B. & G.) ... 34
Zeng-jil(Garo) 57

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

INDEX OF CHEMICAL CONSTITUENTS

A

Abromasterol A 1
Abromine 1
Acaciol 1
Acetylalizarin 75
Acetylandromedol 87
Acetylcholine 9, 26
β-Acetyldigoxin 24
L-2(Acetyldihydrolycopodine) ... 60
Acetyleugenol 95
Acetylgitaloxin 24
Aconitine 2
Acramerrin 31
Acutagenol A 10
Acutagenol B 10
Adenin 37
Adenosine 99
Adrenaline ... 3, 27, 94
Adynerin ... 73, 74
Aflatoxin 7
Ajmalicine ... 85, 86, 100, 101
Ajmaline ... 85, 86
Alanine 4, 18, 51, 59, 78, 88
Alamarckine 4
Albigenic acid 4
Aldobiuronic acid ... 1, 15, 19
Alfalfone 66
Alizarin 75
Alizarin α-methylether ... 75
Alliin 4, 5
α-Allocryptone 44
Allocryptonine 8
α-Allocryptonine 7
β-Allocryptonine 7
α-Allocryptopine 94
Allo-imperatorin 3, 37
Allosecurinin 91
Allyl disulphide 23
Allyl isothiocyanate 23
Aloe-emodin 13
Aloe-emodin glucoside ... 14
Alpinin 5
Alstonin 85
Alstonine 85
Alstovenine 5
Amarin 59
Ambrettolide 38
α-Aminobutyric acid ... 51
α-Amino-β-(pyrazolyl-N) propionic acid 16
Amylase 66
β-Amylase 32
Amyrin 81
α-Amyrin ... 5, 28, 37 78
β-Amyrin 18, 37, 45, 55, 74, 78 100
Amyrin acetate 81
α-Amyrin acetate 78
β-Amyrin acetate ... 9, 18, 100
β-Amyrine 1
Anaferine 102
Andrographolid 6
Andromedotoxin 87
Anethol 30, 80
Angelicin 7
Anhygrine 102
Anisaldehyde 30
Anisic acid 30
Anthemol 6
Anthocyanins 32, 52
Antiarin 7
Aparajitin 18
Apigenin 2, 87
Apiin 100
Arabinose 26, 29
L-Arabinose 1, 63
3-Arabinoside 30
Arachidic acid 3
Arachine 7
Arbinol 32
Arborine 32
Arborinine 32
Arborinols A & B 32
Arbutin ... 7, 33, 85
Archicin 6, 93
Archin 93
Archinin 93
Arecoline 7
Arginine 4, 18, 36, 37, 59, 88
Aristolochic acid 8
Aristo-red 8
Aritasone 15
Arjunalic acid saponin ... 95
Arnidendiol 8
Aromadendrene cineol ... 3
Artemisetin 8
Artocapanone 9
Artocarpin 9
Arturmerone 21
Asarone 2, 9
Ascaridole 15
Asclepiaside D 9
Ascorbic acid ... 11, 14, 17, 27, 36, 38, 39, 40, 48, 51, 54, 63, 65, 66
l-Ascorbic acid 97
Ascorbigen 11
Asiaticoside 14
Asmane 76
Asparagin 37
Asparagine 4, 59
Aspartic acid ... 4, 18, 59
Asteracanthicine 9
Asteracanthine 9
Asterol I, II, III & IV ... 9
Astragalin 84
Astragetin 26

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Atranorin 77
Atropine ... 9, 22, 43, 91
Auraptene 16
Aviprin 83
Ayapin 23
Azafrine 4
Azulene ... 1, 6, 26, 65, 100
Azulenic sesquiterpenes ... 45
Azulenogenic oil 21

B

Bakalactone 66
Balsaminasterol 45
Barbatic acid 99
Barringtogenol B, C & D ... 10
Barringtonin 10
l-Bebeerine 16
Behenic acid 3, 20
Bellardine 10
Benzoic acid 74
Benzylamine 71
Berbamine 10
Berberine ... 7, 8, 10, 62
Bergapten ...7, 29, 37, 79, 83, 89
Bergenin 11
Berlambine 10
Berperine 94
Bessisterol 71
Betaine 2, 36, 76, 78, 98, 103
Betonicine 2
Betulic acid ... 10, 84, 89
Betulin 26, 90
Betulinic acid 6, 26
Biculline 20
Bidigitoxoside 24
Biflorine 75
Biflorone 75
Bisabolene 22
Blepherin 11
Borneol ... 8, 88, 103
d-Borneol 96
Borneol esters 8
Bornyl acetate 88
Brucine 94
Buphanine 34
Burmannaline 21
Buxamine 11
Buxaminol 11
Byakangelicin 37

C

Cadinene 35, 74
d-α-Cadinene 6
γ-Cadinene 22
Caffeic acid 45, 97
Caffeine 28, 45
Calamene 2
Calamenenol 2
Calotropagenin 12
Campanulin 87
Camphene 8
Camphor ... 8, 21, 79, 88
D-Camphor 101
Candicine 62
Cannabidiol 12
Cannabistrin 38
Canvincine 100
Capric acid 16
Caranine 20
Cardiovalen 99
Cardol 42
4-Carene 103
Carnaubyl alcohol 8
Carotal 23
Carotene 32, 36, 40, 51, 80, 88, 102
α-Carotene ... 47, 58, 62, 88
β-Carotene 33, 35, 47, 56, 58, 60, 66, 99
Carotenoids 32, 44
Carpaine 13
Carvacrol 19
Carvone ... 6, 13, 67, 68
l-Carvone 68
dl-Carvotanacetone 103
Caryophyllene 95
α-Caryophyllene 35
β-Caryophyllene 26, 35
d, l-Catechin 66
Catecholamine 72
Catharanthine 101
Catharine 100
Cavincine 101
Cedrelone 14
Cedrol 14
Cephaeline 4
Cephalin 56
Cerberin 15, 96
Cernuine 60
Cerotic acid 3, 4
Ceryl alcohol 7
Chakranine 11
Chaksine 13
Chalcone glucoside 83
Chalcone glycoside 32
Chamazulene 2, 65
Chanoclavine 47
Chasmaconitine 2
Chasmanthinine 2
Chavicol ... 19, 63, 80
Cheiroside A 15
Chelerythrine 44, 94
Chelidonic acid 31
Chelirubine 44, 94
Chlorogenic acid 47
Chlorogenin 30, 102
Chlorophyll ... 32, 44, 95
Chlororomazine 10
Choline ...1, 2, 7, 20, 36, 37, 44, 51, 59, 75, 76, 83, 98, 102
Chrysanthenone 15
Chrysophanic acid 13
Cichorin 30
Cineol ... 60, 67, 72, 79, 80
1 : 8-Cineol 51
Cineole ... 8, 9, 68, 88, 89
Cinnamyl-cinnamate 60
Cinnamyl cocaine 28
Citbittol 16
Citral 3, 17, 21, 22, 26, 57
Citric acid 17, 36, 39, 60, 63, 75, 78, 88, 99

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

l-Citronellal 17
l-Citronellol 88
Citropten 16
Citrullene 16
Citrulluic acid 16
Citrulluin 16
Clavolonine 60
Clerodin 18
Cocaine 28
Coccinine 34
DL-Coclaurine 18
Codeine 77
Colchicine 19, 31
Colinin 56
Collatolic acid 77
Columbamine 10
Columbin 48
Conessine 40
α-Coniceine 19
Coniine 19
Consolidine 23
Convallamarin 19
Convallarin 19
Convallatoxol 19
Convallotoxin 19
Coptisine 44, 94
Corchorin 19, 20
Corchoroside A & B ... 19
Corlumine 20
Cortisone 92
Corymine 42
Corytuberine 94
Coumarin 40, 66
Crataegus lactone 20
Cratagolic acid 84
Crinalbine 20
Crinamine 20
Crinidine 20
Criwelline 20
Cucurbitacin B 18, 59
Cucurbitacins C, D, E, G & H ... 59
Cuminaldehyde 21
Cuminyl alcohol 21
l-α- and *l*-β-Curcumene ... 21
Curcumin 21
l-Curine 16
Cuscohygrine ... 10, 28, 64, 102
Cyanidin diglucoside ... 39
Cyanidin monoglycoside ... 46
Cyanidin pentoseglycoside ... 50
Cyanidin 5
p-Cymene 8, 21, 22, 96, 97, 103
Cynin 85
Cythocol 21
Cytisine 93

D

Damascenine 74
Dammaradienol 46
Daucine 23
Daucol 23
Deacetyldigilanide A & B ... 25
Deacetylmatricarin 2
Deacetyloleandrin 74
Dehydroascorbic acid ... 40
Dehydrocevodiamine 28
Delcosine 23
Delphonin 23
Delsoline 23
Denudatine 23
Deserpidine 86
Desoxycorticosterone ... 32
Desoxymorellin 31
Diacetylmaderin 79
Dictamine 3
Dictamnine ... 24, 102
Diginatin 24
Diginin 24, 25
Diginun 24
Digiproside 24, 25
Digitalinum verum 24
Digitalonin 24
Digitogenin 25
Digitonide 1
Digitonin 25
Digitoxigenin 24, 25
Digitoxin ... 24, 25, 73, 94
Digoxigenin 24
Digoxin 24, 25
Dihydrocarveol 68
d-α-Dihydrocarveol 103
l-Dihydrocarvone 6
Dihydrofurocoumarin ... 3
Dihydroisomorellin 31
Dihydrokaempferide 84
Dihydrolycopodine 60
Dihydrolycorine 61
Dihydrostigmasterol 80
Dilimonene 24
Dillapiol 6
2,6-Dimethoxybenzoquinone ... 4
Dimethylcolchicine 31
Dimyrcene 19
Dioscorine 26
Diosgenin ... 10, 25, 26, 98
Diosphenolene 67
Diospherol 67
Dipentene 21, 24, 30, 68, 76, 97, 102
Distichine 34
Diterpene phenol 49
(−)-3α, 6β-Digiloyloxytropane 22
Dopamine 72
Dulcitol 21

E

Ecgenol methyl ether ... 2
Echinatin 59
Echinocystic acid 4
α-Elaostearic acid 84
α-Elatrine 16
Eleanolic acid 75
β-Elemene 46
Elemicin 22
Elenolide 75
Ellagic acid ... 6, 28, 35, 84, 95
Ellagitannin 30
Embelin 27
Emblicol 27
Emetin 4
Emetine 61

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Emodin glucoside 14
Emulsin 66
Entagenic acid 27
Ephedrine HCl 27
Epi-friedelanol 28
Epi-smilagenin 25
D-Epilupinine 60
12,13-Epoxy-9-octadecenoic acid 14
5-α-Ergost-7-en-3β-ol ... 75
5-α-Ergost-8-(14)-en-3β-ol 75
Ergosterol ... 82, 88, 99
Ergot 18
Ergotoxin 79
Erosone 76
Erucic acid 23
Escigenin 3
Escin 3
Esculetin 3
Esculin 3, 30
Estragol 24, 30
Estragole 30
Ethyl gallate 35
Ethyl hydnocarpate ... 42
Ethyl-salicylate 19
Eugenol 12, 19, 51, 63, 74, 80, 95
Euparin 28
Eupatol 28
Eupatoriopicrin 28
Euphorbine 28
Evidinone 28
Evodiamine 28
Evodin 28
Evogin 28
Evolvine 29
Excelsin 4

F

γ-Fagarine 32
Fangchinoline 94
Faradiol 8
Farnesol 38
Fawcettiine 60
Fawcettimine 60
Fenchone 30
Fenicularin 30
Feronialactones 29
Filicic acid 27
Filicin 26, 27
Fistucacidin 14
α-Flavospidic acid 27
Flemingin 29
Flindersiamine 99
N-Formyldeacetyl-colchicine ... 31
Friedelin 64, 87
Friedeline 46
Fructose ... 5, 28, 60, 63
Frugoside 95
Fucoidin 30
Fulvoplumierin 81
Fumaric acid 30
Furanocoumarin 37
Furfural 95
Furfuryl alcohol 51

G

Galactolipids 81
Galactomannan 11, 19
Galactose 26, 29
d-Galactose ... 1, 63, 84
d-Galacturonic acid 63, 84
Galangin 5
Gallic acid ... 27, 87, 95
α-Gallocatechol 14
Gallotannin 6
Gamatin 82
Genin A 3
Genistein 97
Geranic acid 22
Geraniol 17, 22, 23, 26, 51, 88
Geranyl salicylate 22
Geranyl tiglinate 78
Gindarine 94
Gindarinine 94
Girinimbin 72
Gitalin 25
Gitatoxin 25
Gitogenin 102
Gitorin 24
Gitostin 25
Gitoxigenin 24, 25
Gitoxin 24, 25
Globulins-1 & 2 59
α- and β-Globulins 60
Glucodigifucoside 25
Gluco-fructosan 36
Gluco-gitatoxin 24
Glucoiberin 45
Gluconic acid 84
Glucose 3, 5, 28, 30, 36, 45, 60, 63
6-Glucoside of aureusidine ... 16
Glucosidovanilloyl-glucose ... 80
Glucuronic acid ... 3, 26, 29
L-Glucuronic acid 1
6-D-Glucuronoside-D-galactose ... 1
Glutamic acid 18, 59
β-(γ-L-Glutamyl)-aminopropio-nitrile ... 52
Glyborine 32
Glyceric acid 100
Glycine ... 18, 59, 78, 88
Glycollic acid 4
Glycorine 32
Glycoside D 82
Glycoside E 82
Glycosin 32
Glycosmicine 32
Glycosamine 32
Glycosminine 32
Glycyrrhetinic acid 32
Glycyrrhizic acid 32
Gonystylol 33
Gossypetin 38, 39
Gossypitrin 39
Gossypol 33
Graveoline 89
Graveolinine 89
Guaiacol 12
Guaiazulene 1
Guaijavalic acid 84

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Guaiol 28
Gufruside 95
Gyposgenin 59

H

Haemagglutinin 36, 45
Haemanthine 34
Harmine 97
Harmaline 78
Harmalol 78
Harman 97
Harmine 78
Hayatine 16
Hayatinine 16
Hecogenin ... 3, 30, 82
Hederin 35
Hederogenin 40
Helianthic acid 36
Heliotrine 36
Heliotrioline 36
Hellebrin 37
Hemanthamine 20
Hemnin 40
Hentriacontane ... 2, 59, 74, 78
Heraclenin 83
Hernandion 37
Herniarin 38
Hersaponin 10
Hespiridin 17
Hexatriacontane 4
Hexitol 18
Hibiscetin 39
Hibiscin chloride 39
Hibiscitrine 39
Hibiscus acid 39
Histamine ... 28, 31, 101
Histidine 4, 36
Homoferreirin 76
Homoflemingin 29
Homo-orientin 101
(—)-Homostachydrine ... 66
Hoyin 42
Humulone 42
Hurain 42
Hurin 42
Hydrangeic acid 42
Hydrangenol 42
Hydrocortisone 32
Hydrocoumarin 66
7-Hydroxycoumarin geranyl-ether 16
7-Hydroxy-3α,6β-digiloyloxytropane... 22
5-Hydroxytryptamine ... 31
Hymentharene 43
Hyoscine ... 22, 23, 43, 64
Hyoscyamine ... 9, 23, 43, 64, 91
l-Hyoscyamine 91
Hypericin 44
Hyperin 44
Hyperoside ... 44, 82, 88
Hypoglycine A 11
Hypotuberostemonine ... 93
Hypoxysin 31

I

Ilexic acid 45
Ilicin 45
Ilixanthin 45
Imperatorin 83
i-Inositol 58
Inulenin 46
Inulides 36
Inulin ... 36, 46, 98
Inuline 46
Invertase 66
Iodine 37, 38
β-Ionone 22, 53
Ipecoside 14
Ipomein 47
Ipomose 47
Ipuranol 47
Ipurolic acid 47
Iridin 48
Iso-arbinol 32
d-Isochondrodendrine 16, 21, 94
Isocorydine 20, 94
D-nor-isoephedrine 14
Isoflavone glycosides ... 32
Isoimperatorin 83
Isoleucine 18, 51
Isoleurosine 100
Isoliquiritin 32
D-Isolysergamide 47
d-Isomenthone 67
Isomorellin 31
Isopelletierine ... 84, 102
dl-Isopelletierine 102
Isopimpinellin 5, 92
Isopsoralidin 84
Isoquercetin 44
Isoquercitrin ... 3, 75, 82, 84
Isoraunescine 85
Isoreserpinine 85
Isoreserpiline 85
Isorhamnetin 3, 75
Isorhoeadine 77
Isotetrandrine 10
Isothebaine 76
Isotuberostemonine 93
Isovenenatine 5

J

Jacobine 91
Jacoline 91
Jaconine 91
Jacozine 91
Jalapin 47
Jambolin 95
Jatrorrhizine 10, 62
Juglansin 48
Juniperene 49
Juniperol 49

K

Kaempferide 5
Kaempferol 21, 23, 45, 50, 51, 83
Kaempferol-3-arabinoside ... 3

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Kaempferol-3-glucoside ... 3, 51
Kaempferol-3-rhamnoglucoside ... 3, 73
Kajidin 6
Keranjin 82
Ketoheptose 60
3-Ketosteroid 16
Khellactones 5
Khellin 5
Khillin 5
Kikusaginine 99
Kobanin 23
Kokusaginine 32, 89
Komalin 83
Kopsine 50
Krypto-xanthin 33
Kurrim 80

L

Lactic acid 63
Lactone ... 6, 48, 90
δ-Lactone 18
Lactucarium 51
α-Lactucerol 28
Lambertine 10
Lanatosides A & B 24
Lancamarone 52
Landene A & B 52
Lantanine 52
Lapachol 32
Lappaconitine 2
Lasiocarpine 36
Laureoline 92
Laurotetanine 57
Lauric acid 16, 57
Lecanoric acid 77
Lecithin 56
Lelobine 58
Leonurine 54
Leucenine 55
Leucenol 55
Leucine ... 4, 18, 59, 78, 88
Leucocyanidin ... 7, 12, 14, 44, 57
Leucocynictin 11
(+)-Leucodelphinidin ... 95
Leuconos 55
Leurosine 100
Leurosivine 101
Leutolin 21
Lichnerinine 100
Lignan 82
Lignoceric acid ... 3, 12, 64
Ligroin 8
Limonene ... 6, 17, 67, 68
d-Limonene ... 17, 45, 55, 95
dl-Limonene 17, 84
Linalool ... 17, 26, 27, 41, 51, 67, 74, 76, 96, 102
l-Linalool 41, 95
α-Linalool 63
Linalyl acetate ... 17, 27, 41, 102
l-Linalyl acetate 95
Linamarin 56
Linin 56
Linoleic acid ... 1, 3, 9, 12, 13, 20, 23, 28, 38, 64, 81
Linolenic acid 23, 54
Lipides 27
Lipoxidase 32
Lippione 56
Liquid glucose 64
Liquiritigenine chalcone ... 32
Liquiritoside 32
Liriodendrin 57
Lobeline 52, 58
Lobelinin 58
Lobinine 58
Lochnerine 100
Lochnericine 101
Lochneridine 100
Lochnerivine 101
Longifolene 49
Luffamarin 59
Lumicolchicine 31
Lupeol ... 5, 9, 18, 20, 26 28, 37, 78, 100, 103
Lupeol acetate ... 18, 55, 78, 100
Lupinine 60
d-Lupinine 59
Lupulone 42
Lutein 33
Luteolin ... 2, 15, 58
Luteolin 7-glucosides ... 23
Lycopene 60
Lycopodine 60
Lycorine 20, 34, 43, 61, 76
Lycotonine 46
D-Lysergamide 47
Lysine 59, 88

M

Maaliol 99
Machacrinic acid 4
Machiline 61
d-Magnocurarine 34
Magnoflorine ... 18, 62, 96
Magnoflorine picrate ... 10
Malanthin 4
Malic acid ... 8, 36, 39, 63, 75, 84, 88, 90, 99
Malvic acid 63
Malvidin 35
Malvin chloride 85
Mandragorine 64
Mangiferin 64
D-Mannital 31
Mannitol ... 4, 14, 74
D-Mannitol ... 18, 21, 80
Manthidine 34
Manthine 34
Marmasin 3
Marmesin 29
Marrubin 65
Marsiline 65
Maslinic acid 84
Matricarin 2
Matrine 93
Maxima substances A, B, C ... 95
Maximin 95

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Meconic acid 77
Melanoxetin 95
Mellictine 23
Melliktin 23
Melodin 67
Melodinin 67
Menthoeonine 51
Menthofuran 67, 68
Menthol 67, 68
Menthone 67, 68
Menthyl acetate 67, 68
α-(Menthylenecyclopropyl)glycine 57
Mesembrine 69
Meteloidine 22
Methionine 4, 59
7-Methoxycoumarin 8
2-Methoxy-1,4-naphthoquinone ... 46
Methyl acetate 68
Methyl chavicol 74
Methyl cinnamate ... 60, 74, 102
N-Methylconiine 19
Methylcytisine 93
dl-Methyl ellagic acid ... 96
L-Methylene pyrolizidine ... 20
O-Methylthalicberine ... 96
β-Methyl-D-glucoside ... 66
Methyl heptenone 22
Methyl lycaconitine 46
Methyl mercaptan 76
Methyl *n*-nonyl ketone ... 102
Methyl β-orcinol carboxylate ... 78
Methylpelletierine 84
Mevalonic acid 23
Mimosine 55
Minpaimine 30
Minpaiminine 30
Mitragynol 70
Mitraphylline 100
Mitraversine 70
Mitrinermine 70
Monacetylsogorine 2
Monocrotaline 20
Monogynol A 66, 67
Monogynol B 67
Montanine 34
Morellin 31
Moringine 71
Morphine 77
Mucic acid 27
Mucins 63
Mucronaline 20
Mucuadine 71
Mucuadinine 71
Mucuadininine 71
Multiflorin 88
Mundulone 71
Munetone 71
Muricatin A 46
Myrcene 19, 22
Myricetin ... 1, 35, 38
Myricitrin 26
Myricyl alcohol 32
Myristic acid 20
Myristone 66
Myrtenol 72
Myrtinyl acetate 72

N

Narcotine 60, 77
Narcotoline 77
Natalensine 34
Nelumboside 30, 73
Neodigoxin 24
Neohesperidine 17
Neohydrangin 43
Neoisoliquiritin 32
(+)-Neoisopulegol 68
Neosakuranin 83
Neprotine 62
Neriantin 74
Neriifolin 15, 96
Neriodin 73
Nerol 26
Nerolidol 22
Niacin ... 38, 39, 54, 63
Nicotine ... 71, 102
Nicotinic acid 44
Nigellone 74
Ninhydrine 11
Nobilitin 17
Nodiflorin A & B 57
Nonacosane 31
Nonanal 95
Norbuxamine 11
Norepinephrine 72
d-Nor-iso-ephedrine 14
Nornuciferine 73
d-Nor-pseudoephedrine ... 14
Novoimanin 44
Nuciferine 73

O

Ocimene ... 57, 74, 95
Odoratissimin 4
Odoroside H 24
Oleandrin 73, 74
Oleanolic acid ... 2, 4, 26, 27, 59, 92
Oleic acid 1, 3, 12, 16, 20, 28, 54, 64
Oleuropeic acid 75
Olmelin 31
Orientin 82
Orientosid 82
Orthosiphonol 76
Osthol 83
Ougenin 76
Oxyberberine 10
Oxycanthine 10, 62
Oxydigin 24
Oxypeucedanin 83
Oxysanguinarine 94

P

Pachyrrhizid 76
Pachyrrhizone 76
Paipunine 93
Palmatine ... 10, 62, 94
Palmatine chloride 10
Palmitic acid 1, 2, 4, 12, 23, 54, 64
Papaverine 77

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Parahydrangin 43
Patulitrin 83
Pectin 16, 21
Pectinase 66
Pectolinarin 97
Pelargonidin 3-galactoside ... 30
Pelargonin 85
Pelletierine 84
Pentatriacontane 20, 30
d-Perillaldehyde 55
l-Perillyl alcohol 74
Perividine 100
Perivincine 100
Perosine 100
Peruvoside 96
Petitgrain oil 17
Petunidin 35
Peucedanin 83
Phaeanthine 34
Phellandrene .. 6, 75, 102
d-α-Phellandrene ... 3, 30, 103
Phenethyl alcohol 88
Phenylalanine ... 4, 59, 88
Phenylhydrazone 79
Phenylurethan 96
Phlobaphene-producing tannins ... 14
Phloretin 63
Phyllemblic acid 27
Phyllembin 27
Physcion 14
Phytin 56
Phytosterin 33
Phytosterol 11, 36, 54, 61, 88, 102
Picropodophyllin 82
Picrorhizin 80
Picrosalvin 89
Picrotoxin 45
Pilocarpine HCl 7
Pinene 45
α-Pinene 96, 97
β-Pinene ... 79, 103
dl-Pinene 76
d-α-Pinene ... 49, 79, 80
d-β-Pinene 8
Pineol 67
Pinnatin 82
l-Pinocamphene 45
α-Pinosterol 16
Pipecolic acid 100
Piperidine 12
Piperine 80
Piperitenone 67
Piperitenone oxide 67
Piperitone 67, 68
Piplartine 80, 81
Pistacienonic acids A & B ... 81
Pituitrin 78
Plumbagone 26
Plumieride 81
Podophyllin 82
Podophyllotoxin 82
Podophyllotoxin-β-D-glucoside ... 82
Polygodial 82
Polymyrcene 19
Polystachyosid 82
Pongapin 82, 83
Porphyroxine meconidine ... 77
Powelline 20
Pristemerin 83
Proline 4, 78
Protoine 20
α-Protolichesterinic acid ... 77
Protopine ... 8, 43, 44, 94
Protostemonine 93
Provitamin A 44
Prurienidine 71
Pseudo-hydrangin 43
Pseudo-hypericin 44
Pseudo-inulin 46
Pseudo-pelletierine 84
Pseudo-santonin 8
Pseudotropine 22, 102
Pseudowithanine 102
Psoralen 7, 29
Psychotrine 4
Pterygospermin 71
Pulegone 67, 68
Pulespenone 68
Purine bases 36
Purpurea glucosides A & B ... 24
Purpurin A & B 95
Pusiline 100
Pusilinine 100
Putrascine 28
(−)-β-Pyrozolylalamine ... 16
Pyrocatechol 28
α-Pyrocatechol 14
Pyrrolidine 23

Q

Quebrachitol 33
Quercetagetin 15
Quercetin 5, 15, 35, 38, 44, 50, 82, 87, 88
Quercetin 3-arabinoside ... 30
Quercetin-diglucoside ... 82
Quercetin 3-D-galactoside ... 88
Quercetin-3-rhamnoglucoside ... 73
D-Quercitol 21
Quercitrin ... 41, 44, 82, 100
Quinazoline 78
l-Quinic acid 74
Quinovic acid 103

R

Raffinose 1, 84
Raubasine 85
Raunescine 85
Raupine 85
Rauwolscine 85
Reidin A, B & C 87
Rescinnamine 85
Reserpiline 85
Reserpine ... 10, 85, 86, 100
Reserpinine 85, 86
Reticuline 6
Rhamnazine 82
3-Rhamnoglucoside kaempferol ... 13
Rhamnose ... 26, 29, 45
D-Rhamnose 1
L-Rhamnose 63

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Rhazidine 87
Rhazine 86
Rhein 13
Rhoeadine 77
Rhoeagenine 77
Rhoerubine 77
Rhyncophylline 70
Riboflavin ... 20, 38, 39, 54, 63
Roemerine 73
Rotenone ... 75, 76, 95
Rottlerin 63
Rotundifoline 70
Rotundifolone 68
Rotundine 94
Royline 46
Ruberythric acid 75
Rubichloric acid 75
Rutaecarpine 28
Rutin 1, 3, 11, 13, 21, 28, 29, 33, 42, 44, 57, 87, 93, 95
Rutoside 29
Ruvoside 96

S

Sabdaritrin 39
l-Sabinene 45
Sakuranin 83
Salazinic acid 77, 99
Salicifoline 62
Salicylic acid 58
Sanguinarine 44
Sanguinarine-chelerythrine ... 7
Sankhpuspine 19
α- and β-Santalenes 89
Santonin 8
β-Santonin 8
Sapogenin ... 2, 4, 25, 102
Saponosides 35
Sarpagine 85, 86
Sarpajmaline 86
Sarsapogenin 9, 92
Saussurea lactone 90
Scillaren A 99
Scindapsin A & B 91
Scopolamine 22, 23
Scopoletin ... 23, 81, 85, 92
Securinine 91
Sedoheptulosan 19
Selinene 92
Senecionine 20, 91
Seneciophylline 91
Sennidin C 87
Sennosides A & B 13, 14
Serine 4, 88
Serotonin 72
Serpentine ... 85, 86, 101
Serpine 85
Shakurichin 29
Shikimic acid 12
Silicotungstic acid 57
Sinapine 65
Sinapic acid 54
Sinostemonine 93
Sitosterol ... 3, 33, 41, 54, 103
β-Sitosterol 3, 4, 7, 11, 13, 14, 16, 18, 20, 26, 28, 29, 32, 37, 47, 49, 64, 71, 74, 75, 78, 83, 84, 89, 93, 97, 98, 100, 102
γ-Sitosterol ... 3, 4, 14, 17, 18, 83
Sitosterol glucoside 47
β-Sitosterol D-glucoside ... 17
Sitsirikine ... 100, 101
Skimmianine ... 24, 32, 89, 92, 99
Smilogenin ... 26, 102
Smilagenone 25
α-, β- and γ-Soladulcine ... 92
Soladulcinine 92
Solamargine 92
Solamine 93
Solanine 60
Solasonine 92
Somniferine 102
Somniferinine 102
Sorbitol 18
Soyasapogenal B & C ... 97
Sparteine 22, 60
Speciosine 19
Spergulagenin 70
Spinasterol 71
α-Spinasterol ... 45, 100
Stachydrine 54
L-(−)-Stachydrine 2
l-Stachydrine 13, 66
Stearic acid ... 1, 12, 23, 54, 64
Stearoptene 88
Stearine 8
Stebloside 94
Stictic acid 99
Stigmastanone 89
Stigmasterol ... 1, 10, 26, 29, 32, 46, 49, 89, 92, 100
Strepogenin 26, 79
Strospeside 24, 25
Strychnine 94
Succinic acid ... 28, 63, 83, 88, 99
Sucrose ... 60, 63, 102
Suffinose 28
Suffruticodine 91
Swietenine 94
Synanthrin 46

T

Tagetone 95
Tannic acid 28, 50
Tannin ... 1, 57, 95, 98, 103
Taraxasterol 28, 29
Taraxerol 28, 72
Taraxerone 89
Tartaric acid ... 39, 75, 90, 99
Taxine A & B 95
Tazettine 34, 43
Tecostanine 94
Tecomine 94
α-Terpinene 3
γ-Terpinene 97
δ-Terpinene 103
Terpinenol-4 49
4-Terpineol 103
α-Terpineol 17, 41

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Tetrandrine 21
d- and *dl*-Tetrandrines ... 21, 94
Tetrahydroalstonine 101
Tetrahydrocannabinol ... 12
Tetrahydropalmatine ... 94
2: 4: 3′:5′-Tetrahydroxystilbene ... 9
Tetraxerone 97
Thalicberine 96
Thankunic acid 14
Thankuniside 14
Thebaine 76, 77
Theobromine 45
Theophylline 45
Thevefoline 96
Theveneriine 96
Thevetin 15, 96
Thiamine 20, 37, 38, 39, 54, 63, 78
Threonine ... 4, 59, 78, 88
α-Thujaketonic acid 8
β-Thujaketonic acid 8
Thujone 8
Thymene 97
Thymol ... 19, 96, 97
Tigloidine 22
3α-Tigloyloxytropane ... 102
Tigogenin ... 24, 82, 102
Tigonin 30
Tiliacorine 97
Tiliarine 97
Tinosporine 97
Tiogenin 92
α-Tocopherol 35
Tomatidine 60
Tomatine 60
Totarol 49
Δ-Transhexadecenic acid ... 93
Triacontane ... 4, 80, 98
Triacontanol 20
Triacanthine 31
Tricosane 102
Trihydroxy-ketone 70
D-Trilobene 18
3,3′-4-Trimethoxy-4′-hydroxydiphenic acid dilactone ... 93
Triterpene dihydroxy acid ... 36
Triterpenic acid 6, 99
Triterpenic dicarboxylic acid ... 10
Triterpenoid 55,88
Tropine ... 22, 102
Tryptophan ... 4, 59, 72
d-Tubocurarine 16
Tulipiferin 57
Tylophorine 98
Tylophorinine 98
Tyramine 28
Tyrosine ... 18, 78, 88

U

Umbelliferone 92
Umbelliprenin 6
Urease 12, 32
Uridine diphosphate galacturonic acid... 79
Ursolic acid ... 4, 27, 73, 75, 84, 85, 87, 93, 99, 100
Ursonic acid 83
Ursosapónin 85
Usnic acid 99

V

Vakerin 12, 101
Valine ... 4, 18, 78, 88
Vanillic acid 66
Varunol 20
Vasicine 78
Vasicinone 3
Venenatine 5
Verbenalin 99
Vicine 100
Vilangin 27
Vincaleukoblastine 101
Vincamicine 100
Vinceine 100
Vindolicine 100
Vindolinine 101
Vindorosine 100
Vinosidine 101
Violaxanthin 58
Viroallosecurinine 30
Virosecurinine 30
Virosine 30
Visnadotoxin 101
Visnadans 5
Visnagin 5
Visnadinin 5
Vitamin A ... 37, 38, 48, 52, 66, 69
Vitamin B ... 36, 37, 48, 51, 53, 69
Vitamin C 14, 27, 30, 32, 36, 37, 38, 40, 44, 48, 69, 80, 93
Vitamin E 32, 66, 80
Vitamin K 32
Vitexin 101

W

Withananine 102
Withanine 102
Withanone 102

X

Xanthophyll 58
Xanthophyll epoxide ... 58
Xanthotoxin 7
Xylose 3
d-Xylose 93

Y

Yohimbine 85
α-Yohimbine 85
δ-Yohimbine 100

Z

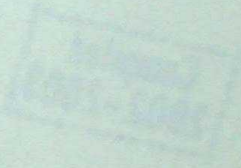
Zatarinol 103
Zeaxanthin 40
Zerumbone 103
Zingiberene 103
Zygophyllin 103

12536 W

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri



CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

	Y
A	[illegible] 3/3
Clas	[illegible] 18.4.2002
Cat on	[illegible] "
Tag	[illegible] "
Filing	[illegible] "
	[illegible] 19-4-02
	[illegible] 18.4.2002
	[illegible] 18-4-02

ADD Work in Catalogue Cards

By.....[illegible].....

Recommended By.....[illegible]

Entered in Database

Signature With Date 19/6/02

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar